

IMS  
Version 14

*Diagnosis*  
*(2020-09-29 edition)*



**Note**

Before you use this information and the product it supports, read the information in [“Notices” on page 713.](#)

2020-09-29 edition.

This edition applies to IMS 14 (program number 5635-A05), IMS Database Value Unit Edition, V14.01.00 (program number 5655-DSE), IMS Transaction Manager Value Unit Edition, V14.01.00 (program number 5655-TM3), and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this information

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These topics provide guidance and reference information for setting up an IMS system for diagnosis, collecting information to help diagnose IMS problems, and searching problem-reporting databases. These topics also describe how to use keywords to develop a failure description that you can use to search problem-reporting databases and communicate with IBM® Software Support.

This information is available in [IBM Knowledge Center](#).

## Prerequisite knowledge

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You will be most successful in using this information if you have a basic understanding of:

- IMS concepts and externals
- How to access an IBM Software Support database
- Dump analyses
- z/OS® diagnostic practices
- Telecommunications
- System Network Architecture (SNA)

You can learn more about z/OS by visiting the "z/OS basic skills" topics in [IBM Knowledge Center](#).

You can gain an understanding of basic IMS concepts by reading *An Introduction to IMS*, an IBM Press publication.

IBM offers a wide variety of classroom and self-study courses to help you learn IMS. For a complete list of courses available, go to the [IBM Skills Gateway](#) and search for IMS.

## How new and changed information is identified

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New and changed information in most IMS library PDF publications is denoted by a character (revision marker) in the left margin. The first edition (-00) of *Release Planning*, as well as the *Program Directory* and *Licensed Program Specifications*, do not include revision markers.

Revision markers follow these general conventions:

- Only technical changes are marked; style and grammatical changes are not marked.
- If part of an element, such as a paragraph, syntax diagram, list item, task step, or figure is changed, the entire element is marked with revision markers, even though only part of the element might have changed.
- If a topic is changed by more than 50%, the entire topic is marked with revision markers (so it might seem to be a new topic, even though it is not).

Revision markers do not necessarily indicate all the changes made to the information because deleted text and graphics cannot be marked with revision markers.

## How to read syntax diagrams

---

The following rules apply to the syntax diagrams that are used in this information:

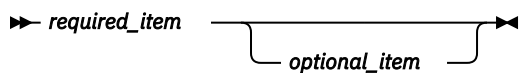
- Read the syntax diagrams from left to right, from top to bottom, following the path of the line. The following conventions are used:
  - The >>--- symbol indicates the beginning of a syntax diagram.
  - The ---> symbol indicates that the syntax diagram is continued on the next line.
  - The >--- symbol indicates that a syntax diagram is continued from the previous line.

– The --->< symbol indicates the end of a syntax diagram.

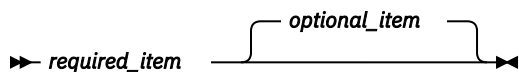
- Required items appear on the horizontal line (the main path).



- Optional items appear below the main path.

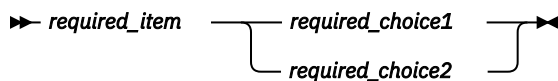


If an optional item appears above the main path, that item has no effect on the execution of the syntax element and is used only for readability.

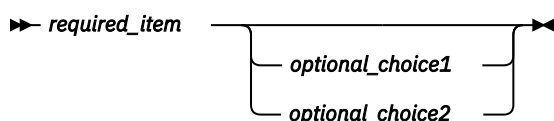


- If you can choose from two or more items, they appear vertically, in a stack.

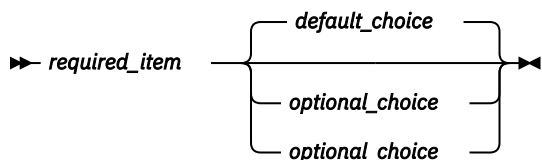
If you *must* choose one of the items, one item of the stack appears on the main path.



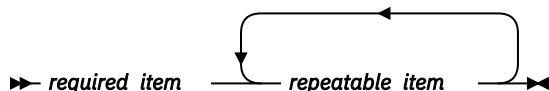
If choosing one of the items is optional, the entire stack appears below the main path.



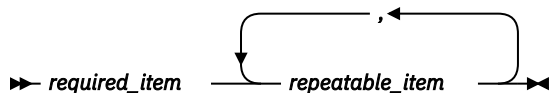
If one of the items is the default, it appears above the main path, and the remaining choices are shown below.



- An arrow returning to the left, above the main line, indicates an item that can be repeated.

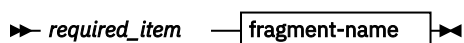


If the repeat arrow contains a comma, you must separate repeated items with a comma.

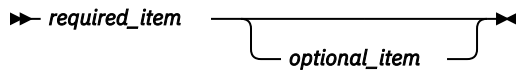


A repeat arrow above a stack indicates that you can repeat the items in the stack.

- Sometimes a diagram must be split into fragments. The syntax fragment is shown separately from the main syntax diagram, but the contents of the fragment should be read as if they are on the main path of the diagram.



## fragment-name



- In IMS, a b symbol indicates one blank position.
- Keywords, and their minimum abbreviations if applicable, appear in uppercase. They must be spelled exactly as shown. Variables appear in all lowercase italic letters (for example, *column-name*). They represent user-supplied names or values.
- Separate keywords and parameters by at least one space if no intervening punctuation is shown in the diagram.
- Enter punctuation marks, parentheses, arithmetic operators, and other symbols, exactly as shown in the diagram.
- Footnotes are shown by a number in parentheses, for example (1).

## Accessibility features for IMS 14

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Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

### Accessibility features

The following list includes the major accessibility features in z/OS products, including IMS 14. These features support:

- Keyboard-only operation.
- Interfaces that are commonly used by screen readers and screen magnifiers.
- Customization of display attributes such as color, contrast, and font size.

### Keyboard navigation

You can access IMS 14 ISPF panel functions by using a keyboard or keyboard shortcut keys.

For information about navigating the IMS 14 ISPF panels using TSO/E or ISPF, refer to the *z/OS TSO/E Primer*, the *z/OS TSO/E User's Guide*, and the *z/OS ISPF User's Guide Volume 1*. These guides describe how to navigate each interface, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

### Related accessibility information

Online documentation for IMS 14 is available in IBM Knowledge Center.

### IBM and accessibility

See the *IBM Human Ability and Accessibility Center* at [www.ibm.com/able](http://www.ibm.com/able) for more information about the commitment that IBM has to accessibility.

## How to send your comments

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Your feedback is important in helping us provide the most accurate and highest quality information. If you have any comments about this or any other IMS information, you can take one of the following actions:

- Submit a comment by using the DISQUS commenting feature at the bottom of any [IBM Knowledge Center](#) topic.
- Send an email to [imspubs@us.ibm.com](mailto:imspubs@us.ibm.com). Be sure to include the book title and the publication number.
- Click the **Contact Us** tab at the bottom of any [IBM Knowledge Center](#) topic.

To help us respond quickly and accurately, please include as much information as you can about the content you are commenting on, where we can find it, and what your suggestions for improvement might be.

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# Chapter 1. Collecting IMS diagnostic information

Before you report a problem to IBM Software Support, collect information to help document the problem at your installation. Having this information available when you call IBM can save you time because you might not need to create the problem again.

As a result of its complexity, IMS can experience problems that must be diagnosed and corrected. Examples of problems that you might encounter while running IMS include an abnormal end (known as an *abend*) occurs in processing, a job hangs in the system and does not process, a process repetitively loops through a series of instructions, or processing slows down.

For these types of problems, IMS displays symptoms that can help you with your diagnosis, but, in order to obtain that information, you need to gather all of the correct data to diagnose a problem.

To collect data about a system problem:

1. Collect the symptom data and determine what type of problem it is.
2. Use the procedures recommended to diagnose the problem to determine whether the problem is an IMS problem or a user problem.
3. If the problem is an IMS or system problem, build a search argument from the data that you collect as a result of following the procedure for that problem. For example, the data you gather from a control region wait can be helpful in building a search argument to search the symptom database with.
4. Search the symptom database. You might need to refine your search with more data from the problem.
5. If you cannot find a known problem with the same symptoms, report the problem to IBM Software Support.

## Related concepts

[Setting up IMS for diagnostics \(System Definition\)](#)

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## Standard IMS diagnostic information

If you contact IBM Software Support for assistance with a problem, you might be asked to collect a standard set of logs, data sets, and dumps that can help them determine the source of your problem. Collecting this information before you contact IBM Software Support will shorten the amount of time required to resolve your problem.

The following table describes the types of information that are most commonly requested by IBM Software Support:

---

*Table 1. Information IBM Software Support might need*

Log, data set, or dump name	Purpose	Which version to save
SYSLOG	The SYSLOG is useful when the dumped MTRACE buffer is not large enough to contain all necessary error messages.	Save the SYSLOG from time of IMS start up.
LOGREC data set	z/OS failures are logged internally.	Save the LOGREC data set from IMS start up time.
IMS master console log	The master console log provides a different message set than the SYSLOG.	Save the master console log from IMS start up time.
IMS log data sets (OLDS)	The IMS log data sets track IMS transaction and database activity.	Save the IMS online data sets that are active at the time of the error.

---

Table 1. Information IBM Software Support might need (continued)

Log, data set, or dump name	Purpose	Which version to save
IMS system log data sets (SLDS)	The IMS system log data sets track IMS transaction and database activity.	Save the SLDS from IMS start up time.
JES job log of jobs related to failure	The JES job log provides JCL start up parameters and isolated system messages.	Save the JES job log from IMS start up time.
All dumps created near the time of IMS failure	Multiple SYS1.DUMPs might be created for related failures. SYSDUMP for the IMS Control, DLI/SAS, and DBRC regions might be created if the primary SYS1.DUMP encounters problems. Also, look for related SYSUDUMPs for IMS dependent regions	Save copies of these dump datasets.
z/OS log data sets	The z/OS log data sets provide information for structure rebuild and checkpoint related problems.	Save the current z/OS log data sets for the failing CQS job stream.

#### Related tasks

[“Collecting data about IMS Connect problems” on page 19](#)

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

## Managing standard diagnostic information

You can preserve documentation that can be helpful near the time of error.

Consider implementing normal operating procedures for the following tasks:

### Preserving the z/OS console (syslog)

The z/OS Console should be saved to view relevant system messages.

- The ideal time frame:
  - Back to the last IMS restart
  - z/OS Console from the prior clean execution (for comparison)
- The moderate time frame:
  - 24 hours of z/OS Console messages
- The minimum time frame:
  - Two IMS system checkpoint intervals

### Preserving the JES JOBLLOG

Preserve the JES JOBLLOG to view relevant job-related messages.

- Save the JES JOBLLOGs for:
  - The IMS control region
  - The IMS DLI/SAS region
  - The IMS DBRC region



- Any suspicious IMS dependent regions
- The CQS regions
- The OM region
- The RM region
- The SCI regions
- The ideal time frame:
  - JES JOBLOG from the current error execution
  - JES JOBLOG from the prior clean execution (for comparison)
- The moderate time frame:
  - 24 hours of JES JOBLOG
- The minimum time frame:
  - Two IMS system checkpoint intervals, or two hours, whichever is greater

### **Preserving the IMS master console log**

The IMS Master Console Log should be saved to view relevant IMS messages:

- The ideal time frame:
  - IMS Master Console Log from the current error execution
  - IMS Master Console Log from the prior clean execution (for comparison)
- The moderate time frame:
  - 24 hours of IMS Master Console
- The minimum time frame:
  - Two IMS system checkpoint intervals or two hours, whichever is greater

### **Preserving the SYS1.LOGREC**

The SYS1.LOGREC should be saved to view system failures logged internally.

- The ideal time frame:
  - Back to the last IMS restart
- The moderate time frame:
  - 48 hours of SYS1.LOGREC data
- The minimum time frame:
  - Current SYS1.LOGREC data set

### **Preserving memory dumps**

Retain all IMS memory dumps generated at or near the time of a problem.

- SYS1.DUMP data sets should be examined:
  - Multiple dumps might be created.
  - Keep all dumps at time of failure, regardless of the subsystem.
- SYSMDUMP for the IMS Control, DLI/SAS, and DBRC regions need to be examined in case of primary SYS1.DUMP failures.
  - Save these data sets, if a dump was produced.
- SYSUDUMP should be saved for IMS dependent regions.

## Preserving the IMS OLDS and SLDS

The IMS OLDS and SLDS should be saved in case IMS log analysis is required.

- The ideal time frame:
  - From the time of the last IMS restart
  - Prior execution
- The moderate time frame:
  - 24 hours of IMS log records
- The minimum time frame:
  - Active IMS OLDS

## Manual intervention for dump creation

---

IMS produces SDUMPs for some internal errors without manual intervention. However, IMS Wait/Loop or partial loss-of-function conditions require manual intervention to produce an SVC dump.

IMS hangs can be caused by interaction with many address spaces, including those shown in the list below:

- IMS control region
- IMS DLI/SAS region
- DBRC region
- IRLM region
- CQS
- Operations Manager
- Resource Manager
- Structured Call Interface
- Troublesome IMS dependent regions
- CCTL regions
- ODBA
- IXGLOGRC
- z/OS Resource Recovery Services
- APPC
- VTAM®
- WLM
- TCPIP
- WebSphere® Application Server
- ESAF - Db2 for z/OS, IBM MQ, others
- Other regions
- Other IMSplex members with all their related regions

## Deciding when to create a memory dump

Because of the complex interactions between these address spaces, it is difficult to determine exactly where the source of the problem lies without a dump of the associated address spaces.

Omission of any interrelated address space adds to the possibility that the dump might not be sufficient to solve the problem.

The time that is required to produce the dump must be weighed against the possibility that there might not be sufficient data to solve the problem, adding to the possibility that the problem could recur.

## Creating IMS memory dumps

IMS SVC dumps can be requested using three different commands.

- z/OS SYS1.PARMLIB IEADMCxx
  - DUMP command parmlib member
- z/OS SYS1.PARMLIB IEASLPxx
  - SLIP command parmlib member
- z/OS DUMP command
- Customized JCL can be built and submitted

## IEADMCxx, z/OS SYS1.PARMLIB

You can use the IEADMCxx, member of the z/OS SYS1.PARMLIB to create an SVC dump.

The following are characteristics of the IEADMCxx member of the z/OS SYS1.PARMLIB data set:

- DUMP command parmlib member
- Can be used to customize IMS memory dumps prior to error event.
- Simple operator interface.
- Create SYS1.PARMLIB members called IEADMCxx for each customized dump command.

### Related reference

[z/OS: Syntax for the IEADMCxx member of the z/OS SYS1.PARMLIB data set](#)

### IEADMCxx example for IMS

This example shows creating a SYS1.PARMLIB member called IEADMCI1. DUMP parameters are given.

Create a SYS1.PARMLIB member called IEADMCI1 containing the following DUMP parameters:

```
JOBNAME=(j1, j2, j3, j4), SDATA=(CSA, PSA, RGN, SQA, SUM, TRT, GRSQ)
```

Where:

- j1** IMS Control region job name.
- j2** IMS DL/I region job name.
- j3** DBRC region job name.
- j4** IRLM region job name.

Create a second SYS1.PARMLIB member called IEADMCI2 containing the following DUMP parameters:

```
JOBNAME=(j5, j6, j7), SDATA=(CSA, PSA, RGN, SQA, SUM, TRT)
```

Where:

- j5** IMS CCTL region 1.
- j6** IMS CCTL region 2.
- j7** IMS CCTL region 3.

### IEADMCxx DUMP activation

When you request a dump from the IEADMCI1 and IEADMCI2 parmlib members, two dump data sets are created on the z/OS image from which the dump command was entered.

To request a dump from the IEADMCI1 and IEADMCI2 parmlib members, enter the following z/OS command:

```
DUMP TITLE=(DUMP OF IMS and CCTL Regions ),PARMLIB=(I1,I2)
```

### IMS sysplex dump considerations

IMS produces SDUMPs for some internal errors without manual intervention. However, IMS Wait/Loop or partial loss-of-function conditions require manual intervention to produce an SVC dump. IMS hangs can be caused by interaction with many address spaces.

The following are considerations for IMS sysplex dumps:

- IMS sysplex implementations need to consider the possibility that a hang or problem on one IMSplex member might be due to a problem originating from another member.
- Problems such as IMS Wait/Loops or partial loss-of-function conditions which require manual intervention to produce an SVC dump, should include SVC dumps from other members of the IMSplex.
- Ensure that a dump is taken for all necessary address spaces on each system.

#### Sysplex IEADMCxx example

This example shows how to create a SYS1.PARMLIB member containing various DUMP parameters.

Create a SYS1.PARMLIB member called IEADMCI1 containing the following DUMP parameters:

```
JOBNAME=(j1,j2,j3,j4),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),  
REMOTE=(SYSLIST=(*'j1','j2','j3','j4'),SDATA))
```

Where:

- j1** IMS Control region job name.
- j2** IMS DLI region job name.
- j3** DBRC region job name.
- j4** IRLM region job name.

Create a second SYS1.PARMLIB member called IEADMCI2 containing the following DUMP parameters:

```
JOBNAME=(j5,j6,j7),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,XESDATA),  
REMOTE=(SYSLIST=(*'j5','j6','j7'),SDATA))
```

Where:

- j6** CCTL region 1.
- j7** CCTL region 3.
- j8** CCTL region 2.

**Note:** The XESDATA and REMOTE parameters are for use in sysplex environments.

### **Sysplex IEADMCxx DUMP activation**

Activating a sysplex dump using the z/OS command **DUMP** is shown.

To request a dump from the IEADMCI1 and IEADMCI2 parmlib members, enter the following z/OS command:

```
DUMP TITLE=(IMS/CCTL SYSPLEX Dumps) ,PARMLIB=(I1,I2)
```

Two dump data sets are created on each z/OS image in the sysplex matching the REMOTE parameter specifications for the JOBNAMEs.



---

## Chapter 2. Collecting data about specific problems

Occasionally, there are problems in specific environments or certain problem types that require special handling.

### Collecting data about a control region wait or hang

---

When an IMS control region waits or hangs, IMS can appear frozen or lose partial function. The most critical piece of information in diagnosing such problems is the z/OS SVC dump.

**Recommendation:** Do not use the z/OS **MODIFY dump (F jobname,DUMP)** command as a source of IMS diagnostic information. This command adds unnecessary complexity to the dump while processing the modify abends.

Obtain a z/OS SVC dump by issuing this series of commands:

```
DUMP COMM=(dump title) R id JOBNAME=(j1,j2,j3,j4,j5,j6),  
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In the previous example,

- j1** is the IMS CTL or DBCTL region job name
- j2** is the IMS DL/I region job name
- j3** is the suspicious IMS dependent region job name, if any
- j4** is the suspicious CCTL (CICS®) region name, if any
- j5** is the IRLM region job name (if IRLM DB locking is used)
- j6** is the DBRC region job name

Also, consider dumping related regions:

- IMS Control region
- IMS DLI/SAS region
- DBRC region
- IRLM region
- CQS
- Operations Manager
- Resource Manager
- Structured Call Interface
- Troublesome IMS dependent regions
- CCTL regions
- ODBA
- IXGLOGRC
- z/OS Resource Recovery Services
- APPC

- VTAM
- WLM
- TCPIP
- WebSphere Application Server
- ESAF - Db2 for z/OS, IBM MQ, others
- Other Regions
- Other IMSplex members with all their related regions

Most likely, a dump of the IMS CTL, DL/I, and a suspicious dependent region or CCTL region is sufficient to solve wait or hang problems. Occasionally, the DBRC and IRLM (if used for DB locking) regions are a factor, so include DBRC and IRLM.

If IMS is not completely stopped (for example, IMS commands can still be entered, BMPs are still processing, and some transactions still process), taking a second z/OS SVC dump will help differentiate normal IMS processing from the problem.

## Collecting data about a control region or DL/I region loop

Occasionally, there are problems in specific environments or certain problem types, that require special handling. If IMS can accept commands, you can set a trace.

1. If IMS can accept commands, use the following IMS command to set up the internal trace environment:

```
/TRA SET ON TABLE nnnn
```

where *nnnn* is the DISP, SCHED, DLI, LOCK or LATCH parameter. Each parameter must be entered in a separate /TRA command.

2. Set the z/OS system trace table size to 999K and turn on branch tracing by issuing the following command:

```
TRACE ST,999K,BR=ON
```

3. Obtain two z/OS SVC dumps of the CTL, DL/I, suspicious dependent region, or CCTL, DBRC, and IRLM regions. Taking a second z/OS SVC dump will help differentiate normal IMS processing from the problem. Obtain a z/OS SVC dump with this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(j1,j2,j3,j4,j5,j6),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In the previous example,

***j1***

is the IMS CTL or DBCTL region job name

***j2***

is the IMS DL/I region job name

***j3***

is the suspicious IMS dependent region job name, if any

***j4***

is the suspicious CCTL (CICS) region name, if any

***j5***

is the IRLM region job name (if IRLM DB locking is used)

***j6***

is the DBRC region job name

4. Reset the z/OS system trace table to its original settings.



**Note:** IMSplex partner dumps are probably not required for loop problems, unless they are also looping.

## Collecting data about an IMS dependent region wait or loop

---

Occasionally, there are problems in specific environments or certain problem types, that require special handling. If IMS can accept commands, you can set a trace.

If the dependent region appears to be looping, follow these steps:

1. If IMS can accept commands, use the following IMS command to set up the internal trace environment:

```
/TRA SET ON TABLE nnnn
```

where *nnnn*= can be DISP, SCHD, DLI, LOCK, or LATCH. Each must be entered separately.

2. Set the z/OS system trace table size to 999K and turn on branch tracing with this command:

```
TRACE ST,999K,BR=ON
```

3. If the problem is a wait, obtain two z/OS SVC dumps of the CTL, DL/I, suspicious dependent region, or CCTL, DBRC, and IRLM regions. If the problem is a loop, obtain two z/OS SVC dumps of the CTL, DL/I, suspicious dependent region, or CCTL, DBRC, and IRLM regions. Obtaining a second z/OS SVC dump will help differentiate normal IMS processing from the problem. Obtain a z/OS SVC dump with this series of commands:

```
DUMP COMM=(dump title)  
R id JOBNAME=(j1,j2,j3,j4,j5),  
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

**j1**

is the IMS CTL or DBCTL region job name

**j2**

is the IMS DL/I region job name

**j3**

is the suspicious IMS dependent region job name, if any

**j4**

is the IRLM region job name (if IRLM DB locking is used)

**j5**

is the DBRC region job name

In the previous example,

4. Reset the z/OS system trace table to its original settings.

**Note:** IMSplex partner dumps are probably not required for loop problems, unless they are also looping.

## Formatting a BPE trace entry

---

You can format a BPE trace entry by using either the Interactive Problem Control System (IPCS) or a batch job.

Before you begin to format BPE trace entries, ensure that the user ID that you use to format and print the external BPE trace records is authorized by RACF® to access the external trace data sets.

To format BPE trace entries by using the IPCS:

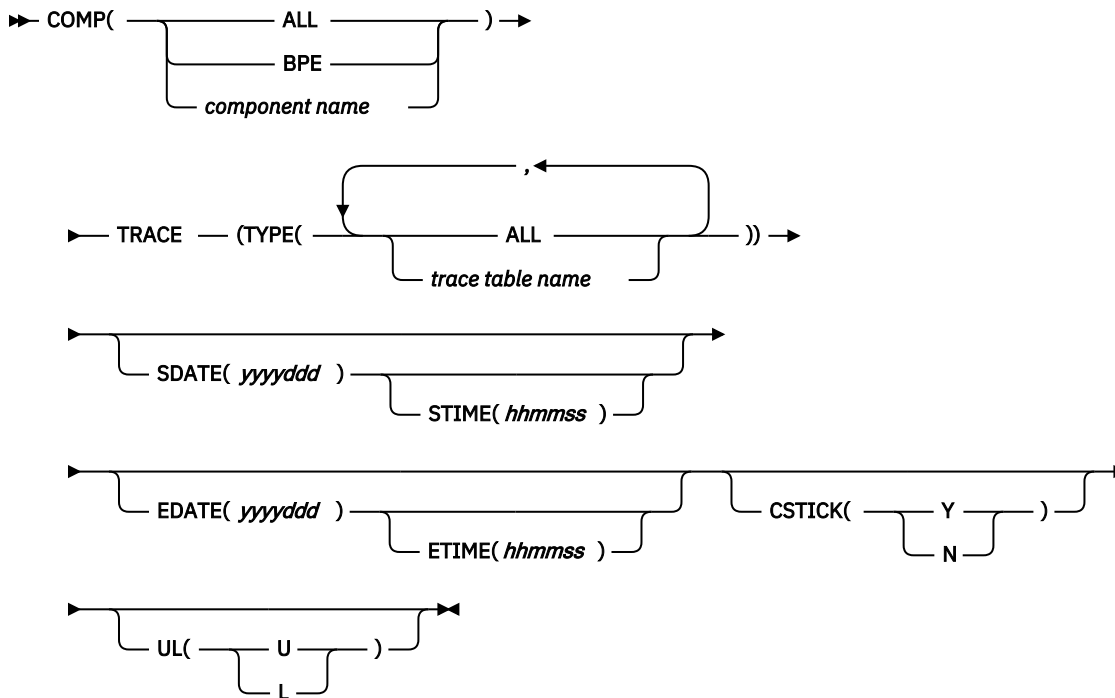
1. Select option 0 from the IPCS Primary Option menu to specify the generation data group (GDG) to analyze.
2. Specify the data set name for the GDG in the **Source** field of the IPCS Default Values menu. For example, specify: DSNAME('BPEEXTRC.GDG01.G0001V00').

3. Select option 2.6 from the IPCS Primary Option menu to display a list of the dump component analysis tools.
4. Select option DFSAAMPR from the IPCS MVS™ Dump Component Data Analysis menu to display options for the IMS Dump Formatter.
5. Select option 6 from the IMS Dump Formatting Primary menu to display formatting for other IMS components, such as BPE.
6. Select one of the options from the IMS Component Selection Dump Formatting menu to display formatting options for an IMS component (BPE, CQS, DBRC, ODBM, OM, REPO, RM, SCI, or IMS Connect). For example, select option **B** to display general BPE formatting options.
7. Select option 4 from the component subsystem dump formatting menu, for example the IMS BPE Subsystem Dump Formatting menu, to display the options for external trace formatting.
8. Specify the various formatting options for the external trace data from the subsystem's external trace formatting menu, for example the BPE External Trace Formatting menu.

You can also format BPE external trace records by using a batch job. The following figure shows sample JCL for formatting the BPE external trace records from a batch job.

*Figure 1. Batch JCL for formatting BPE external trace records*

```
//BPEEXTPR JOB ...
//*****
//* Job to print all traces in a BPE external trace data set. */
//*****
//JOBLIB DD DSN=IMS.SDFSRESL,DISP=SHR
//IPCSDMP EXEC PGM=IKJEFT01,REGION=8M
//SYSTSPRT DD SYSOUT=*
//IPCSPRINT DD SYSOUT=*
//INDEX DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//IPCSPARM DD DSN=USER.PARMLIB,DISP=SHR
// DD DSN=SYS1.PARMLIB,DISP=SHR
//SYSTSIN DD *
DELETE 'SYS1.IPCSDDIR'
ALLOC SP(1) TRACK VOL(333333)
DEFINE CLUSTER (NAME('SYS1.IPCSDDIR') +
  VOLUMES(333333)) +
  INDEX(NAME('SYS1.IPCSDDIR.DDX') +
  TRACKS(1 1)) +
  DATA( NAME('SYS1.IPCSDDIR.DDD') +
  CYLINDERS(1 1) BUFSP(X'10000') KEYS(128 0) CISZ(X'1000'))
IPCSDDIR 'SYS1.IPCSDDIR'
ALLOC FILE(IPCSDDIR) +
  DA('SYS1.IPCSDDIR') +
  REUSE SHR
ALLOC FILE(INFILE) +
  DA('BPEEXTRC.GDG01.G0001V00') +
  REUSE SHR
IPCS NOPARM
SETDEF DSN('BPEEXTRC.GDG01.G0001V00') +
  NOPROBLEM PRINT NOTERMINAL
VERBX BPETRFM0 +
  'COMP(HWS) +
  TRACE(TYPE(RCTR)) +
  SDATE(2008080) STIME(110909) +
  EDATE(2008090) ETIME(140000) +
  UL(L) +
  CSTCK(Y)'
END
DELETE 'SYS1.IPCSDDIR'
/*
```



### BPETRFM0 Parameter Keywords

#### COMP()

Specify 'ALL' to format all trace records, 'BPE' to format BPE trace records, or a specific component name (BPE, CQS, DBRC, ODBM, OM, REPO, RM, SCI, or HWS) to format trace records for only that component.

#### TYPE()

Specify 'ALL' to format trace records for all trace tables or specify a specific trace table name to format records only for that trace table type.

#### SDATE()

Specify a starting date for the trace entries in Julian format (yyyyddd). Trace entries with a store clock (STCK) value prior to the specified date are filtered and not printed.

#### STIME()

Specify a starting time for the trace entries in 24 hour format (hhmmss). Trace entries with an STCK value prior to the specified time are filtered and not printed. SDATE() is required with STIME().

#### EDATE()

Specify an ending date for the trace entries in Julian format (yyyyddd). Trace entries with an STCK value after the specified date are filtered and not printed.

#### ETIME()

Specify an ending time for the trace entries in 24 hour format (hhmmss). Trace entries with an STCK value after the specified time are filtered and not printed. EDATE() is required with ETIME().

#### CSTCK()

Specify 'Y' to have the value for each trace entry printed in JDAYTIME format (DDD HHMMSS.thmiju).

#### UL()

Specify 'L' if the specified filtering time is based on the local time in the trace record or 'U' if the specified filtering time is based on UTC.

### BPETRFM0 formatted BPE external trace record header output

```

-----
--- BPE  ERRV Trace Table ---
-----
ETHD: 00000000
+0000 LL..... 4010  ZZ..... 0000  TYPE..... 01  SUBTYPE.. 02  VERSION.. 0001

```

```

RESERVED. 00000000
+000C NAME..... ERRV      LENGTH... 00000080  UDATALEN. 00000000  TDATALEN. 00003F80  NUMPGS... 0008
ENTLEN... 0020
+0020 ENTSKPD.. 00000000  BVERS.... 010700    RESERVED. 00      UTYPE.... HWS      UVERS.... 0B0100
RESERVED. 00
+0030 USYSNAME.      UTRMOD... 00000000  00000000      FLG1..... 48      FLG2..... 00
LEVEL.... 04
+0043 IDX..... CB      CYCLECT.. 00000000  OFFSET... 00000000  BYTELOST. 00000000  LDT0.... FFFFA21F  68400000
+0058 LSO..... 00000000  00000000      STCK..... C233AA77  1692DF60      RESERVED. 00000000
NEXT..... 00000000
+0070 FIRST.... 0BC01C60  TOKVAL... 00000000  ID..... ETHD END
Flag analysis for ethd_flg1:
  ethd_f1_system (40x) - Trace table is a BPE system table
  ethd_f1_var (08x) - Trace type creates variable length entries
Trace level for this table is: HIGH

ETSF: 00004000
+0000 STCK..... C233AA7D  AE68F180      SEQNUM... 00000000  00000004

Variable trace table entries follow with oldest entry printed first

```

### Formatted BPE external trace variable trace entry

```

ERRV trace table entry:
  Code:      SSRV      Record #: 1
  Subcode: *BPEDYA10 ERROR  Continue: 0
  TimeStmp: 096 183544.830765

TTVE: 00000000

  Variable entry prefix:
  LL..... 1FC0      REC#.... 00000001
  ZZ..... 0000      CONT.... 00000000
  VLEN.... 00001F90

TTE: 00000010

  Variable entry fixed section:
  CODE.... C6      WD02.... 00000002
  SCDE.... 1B      WD03.... 00000003
  B1B2.... C1C2    WD04.... 00000004
  WD01.... 00000001  WD05.... 00000005
  STCK.... C233AA77  1692DF60
  Data +00: |F.AB.....| Data +10: |.....B....k.-|

Data: 00000030 Length: 8080

  Variable entry variable section:
  Offset  0      4      8      C      0      4      8      C      EBCDIC Data
  -----
+000000  81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 |
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa|
  LINES +000020 TO +001F7F SAME AS ABOVE
+001F80  81818181 81818181 81818181 81818181 81818181 |
aaaaaaaaaaaaaaaa|

```

### Related concepts

[“IMS Connect traces” on page 419](#)

You can trace two types of information about IMS Connect: information about the messages that are processed by IMS Connect and information about the IMS Connect subsystem.

### Related tasks

[“Formatting the trace data from an external trace of IMS Connect” on page 423](#)

The following example shows the JCL that can be used to format the trace data from an external trace of IMS Connect.

## Collecting data about DBRC-related problems

DBRC related problems can cause a variety of symptoms, including waits and loops. If you need to create the problem again, copies of the RECON listing, before and after the problem occurred, are most useful.

To diagnose a DBRC related problem, you need the following information:

- A listing of the DBRC RECON data sets for the time that is as close as possible to the time of the failure.

- Use the DBRC LIST . RECON command to obtain the listing.
- A subsystem listing if you cannot obtain a RECON listing because of its size.
  - Use the DBRC LIST . SUBSYS ALL command to obtain a subsystem listing.
- If recreates are possible, obtain the before and after copies of the RECON data sets.
- Use the D GRS , CONTENTION command on each system that shares the RECON data set to determine if the data set is held at the exclusion of other waiters. If so, dump the owning address space by issuing the following command:

```
DUMP COMM=(dump title)
R nn, JOBNAME=(j1), SDATA=(CSA, PSA, RGN, SQA, SUM, TRT, GRSQ), END
```

### Related reference

[z/OS: VSAM Record-Level Sharing \(RLS\) diagnostic aids](#)

## DBRC security override

To set a RCNQUAL value in the RECON that can be used to override DBRC security for copies of RECON data sets, use the DBRC command **CHANGE . RECON** with the CMDAUTH keyword.

You can then use the RECON data set for further testing purposes or to send on to an IBM Software Support representative without requiring a zap of the RECON, an exit routine, or requiring that you find an authorized individual to change the authorization level.

## Collecting data about DBCTL-related problems

DBCTL-related problems can originate from either the CCTL region or one of the IMS regions (CTL, DL/I, DBRC, or IRLM), so it is important to obtain dumps that relate to all these regions.

1. Issue the following IMS commands (because they include region ID numbers and recovery tokens in their various display output):

```
/DISPLAY ACTIVE
```

```
/DISPLAY CCTL
```

The information that is returned by these commands greatly increases the accuracy and speed that is required to diagnose the problem. The DISPLAY ACTIVE command provides the reasons for waits and region numbers. The DISPLAY CCTL command provides recovery tokens and region numbers. Save the IMS console output.

2. Set the AP portion of the CICS trace to level 1-2. Save this output.
3. Set the FILE CONTROL portion of the CICS trace to level 1-2. Save this output.
4. Obtain the necessary z/OS SVC DUMP of the IMS regions by issuing this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(j1,j2,j3,j4,j5,j6),
SDATA=(CSA, PSA, RGN, SQA, SUM, TRT), END
```

In the previous example,

- j1**  
is the IMS CTL or DBCTL region job name
- j2**  
is the IMS DL/I region job name
- j3**  
is the suspicious IMS dependent region job name, if any
- j4**  
is the suspicious CCTL (CICS) region name, if any

**j5**

is the IRLM region job name (if IRLM DB locking is used)

**j6**

is the DBRC region job name

5. Save the IMS online log data set that was active during the failure.

## Collecting data about VTAM-related DC problems

IMS DC-related problems are associated mainly with VTAM or OTMA. Use these guidelines to collect diagnostic information about VTAM when you experience a problem.

VTAM dumps are often required to help diagnose problems, but are infrequently obtained by operations personnel. IMS NODE traces, VTAM BUFFER traces, and VTAM INTERNAL traces are often required, in conjunction with the IMS region dumps and VTAM dumps, to solve DC problems.

The IMS log tapes contain much of the transaction data that flows through IMS. This transaction data includes the following IMS records:

- TYPE01
- TYPE03 (MSG queue entries)
- TYPE11 through TYPE16 (SPAs, DIALs, SIGN)

To start the recreate attempt after issuing an IMS /SWITCH OLDS command to have the related data placed on a new OLDS:

1. Issue the following IMS command and save the IMS console output:

```
/DIS NODE nodename
```

2. Turn on the IMS NODE trace by issuing the following command.

```
/TRA SET ON NODE nodename
```

Data is captured in the IMS TYPE6701 log record. Save the IMS online log data set input to the IMS utility programs DFSERA10 and DFSERA30.

3. (Optional) Turn on the VTAM Buffer Trace and VTAM Internal Trace to complement the IMS NODE trace by issuing this series of commands:

```
F NET,TRACE,TYPE=BUF,ID=nodename  
F NET,TRACE,TYPE=VTAM,MODE=EXT,  
OPT=(API,PIU,MSG)
```

To capture these trace entries, GTF must be active with the USR option specified.

4. Obtain a z/OS dump of the IMS regions by issuing this series of commands:

```
DUMP COMM=(dump title)  
R id JOBNAME=(j1,j2,j3,j4,j5,j6),  
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

**j1**

IMS CTL or DBCTL region job name

**j2**

IMS DL/I region job name

**j3**

Suspicious IMS dependent region job name, if any

**j4**

Suspicious CCTL (CICS) region name, if any

**j5**

IRLM region job name (if IRLM DB locking is used)

## j6

DBRC region job name

In the previous example,

5. Obtain a dump of the VTAM address space by issuing this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(vtam jobname),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

6. Save the IMS log tapes created during the error period.

## Collecting data about OTMA-related DC problems

IMS DC-related problems are frequently related to either OTMA or VTAM. Use these guidelines to collect diagnostic information about OTMA when you experience a problem.

There are four main tools that you can use to diagnose problems with OTMA message traffic:

- OTMT table trace
- /DISPLAY commands
- OTMA tmember and tpipe traces
- IMS log records

1. Enable the OTMT trace table.

Issue the following command:

```
/TRA SET ON TABLE OTMT OPTION LOG VOLUME HIGH
```

This trace data is used by IBM Software Support to diagnose OTMA problems. You can also specify OTMADB=Y in the DFSPBxxx member of the IMS.PROCLIB data set to get more trace data. However, using OTMADB=Y causes a large amount of WTO output to be written to the MVS console, and the setting can be removed only by recycling IMS.

**Recommendation:** Do not set OTMADB=Y unless instructed to do so by IBM Software Support.

2. Get the current status of OTMA clients and servers.

Issue the following command:

```
/DISPLAY OTMA
```

Save the console output.

3. Enable the OTMA tmember trace.

Issue the following command:

```
/TRA SET ON TMEMBER XXXXXXXX
```

Where XXXXXXXX is the tmember name. If you cannot identify a specific OTMA tmember, specify ALL for the tmember name to enable the trace for all members.

4. If you know that the problem is associated with a specific OTMA tmember, you can get the current status for that tmember.

Issue the following command:

```
/DISPLAY TMEMBER XXXXXXXX TPIPE ALL
```

Where XXXXXXXX is the tmember name. Save the console output.

5. If you know that the problem is associated with a specific OTMA tpipe, you can enable tracing at the tpipe level.

Issue the following command:

```
/TRA SET ON TMEMBER XXXXXXXX TPIPE YYYYYYYY
```

Where *XXXXXXXX* is the tmember name and *YYYYYYYY* is the tpipe name.

6. For CM1 and CM0 problems that are associated with a specific PSB, enable DL/I tracing.

Issue the following command:

```
/TRA SET ON PGM pppppppp
```

Where *pppppppp* is the PSB name.

After you enable the required traces, preserve the X'67D0' and X'6701' log records and the console output from the /DISPLAY commands.

## Collecting data about APPC-related DC problems

APPC problems that originate from IMS dependent regions and that make calls explicitly rely heavily on the dependent region dumps.

To diagnose an APPC-related IMS problem:

1. Turn on the IMS LUMI trace for the external trace data set by issuing the following IMS /TRACE commands:

```
/TRACE SET ON TABLE LUMI OPTION LOG
```

The LOG option can be set up to cause the output to be sent to the external trace data set with this /TRACE command:

```
/TRACE SET ON LUNAME XXXXXXXX INPUT
```

```
TRACE SET ON LUNAME XXXXXXXX OUTPUT
```

where *XXXXXXXX* is the partner LU

2. Turn on the VTAM buffer trace and VTAM internal trace to complement the IMS LUMI trace by issuing the following commands:

```
F NET,TRACE,TYPE=BUF,ID=luname
```

```
F NET,TRACE,TYPE=VTAM,MODE=EXT,  
OPT=(API,PIU,MSG)F
```

To capture these trace entries, GTF must be active with the USR option specified

3. Turn on the program trace to trace TPPCB DL/I calls, so that the APPC component trace can send its trace buffers to a SYS1.DUMP data set when it stops. Turn on the program trace by issuing the following command:

```
/TRACE SET ON PROGRAM pppppppp
```

where *pppppppp* is the program name of the application.

4. Turn on the z/OS APPC component trace by issuing the following command:

```
TRACE CT,ON,200M,COMP=SYSAPPC
```

**Note:** If the command above fails, omit the ON keyword.

5. Start the recreate attempt after issuing an IMS /SWITCH OLDS command to have related data placed in a new OLDS. Save the IMS log tapes that are created during the error period. IMS log records are not as useful for explicit APPC applications as they are for implicit APPC applications because little information is logged about explicit APPC applications.
6. Reply to the z/OS outstanding reply with the following response:

```
nn,OPTIONS=(GLOBAL),END
```

7. When the problem has been recreated, stop the component trace with this command:



```
TRACE CT,OFF,COMP SYSAPPC
```

You can use the following IPCS commands to format the trace:

- For one-line entries:

```
CTRACE COMP SYSAPPC SHORT
```

- Summary of each entry:

```
CTRACE COMP SYSAPPC FULL
```

8. Obtain a z/OS SVC dump of the IMS regions with this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(j1,j2,j3,j4,j5,j6),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In the previous example,

**j1**

is the IMS CTL or DBCTL region job name

**j2**

is the IMS DL/I region job name

**j3**

is the suspicious IMS dependent region job name, if any

**j4**

is the suspicious CCTL (CICS) region name, if any

**j5**

is the IRLM region job name (if IRLM DB locking is used)

**j6**

is the DBRC region job name

9. Obtain a dump of the APPC, APPC Scheduler, and VTAM address spaces with this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(j1,j2,j3),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In the previous example,

**j1**

is the APPC job name

**j2**

is the APPC scheduler job name

**j3**

is the VTAM job name

## Collecting data about IMS Connect problems

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

For almost all problems that might occur during IMS Connect execution, you can take the following action to collect the data that is needed to diagnose the problem:

- Create a dump of the IMS Connect address space.
- Save the IMS Connect joblog, which contains only IMS Connect messages. IMS Connect messages are also written to the MVS system log (SYSLOG), but the IMS Connect messages can be difficult to find in the SYSLOG, because of the other z/OS subsystem messages that the SYSLOG contains.

- Save the MVS SYSLOG. The SYSLOG is useful for seeing what messages other subsystems issued before and after the IMS Connect messages were issued, because the MVS SYSLOG contains messages from all z/OS subsystems, including TCP/IP, IMS, and IMS Connect.
- Turn on the IMS Connect Recorder Trace facility and attempt to re-create the problem.

In addition to collecting data about IMS Connect, you might need to collect data about other components or products if they appear to be related to the problem in some way. For example:

- If the problem appears to be network related, you might also need to initiate a TCP/IP packet trace to trace the IP packets flowing to and from a TCP/IP stack on the z/OS Communications Server. For more information about initiating packet traces, see *z/OS Communications Server IP Diagnosis Guide*.
- If the problem is related to IMS Connect support for an IMS TM system, where the connections to IMS are through OTMA, you might also need to collect data about the IMS system.
- If the problem is related to IMS Connect support for an IMS DB system, where the connections to IMS are through an instance of the Open Database Manager (ODBM), which runs in its own address space as a component of the IMS Common Service Layer (CSL), you might also need to collect data about both the IMS system and any ODBM instance that might be associated with the problem.
- If the problem is related to two-phase-commit processing, you might also need to collect data related to z/OS Resource Recovery Services.

### Related tasks

[“Collecting data about CSL-related problems” on page 22](#)

The Common Service Layer address spaces, Open Database Manager (ODBM), Operations Manager, Structured Call Interface, and Resource Manager, produce SDUMPs for internal errors. The CSL dumps are in the SYS1.DUMP data sets.

[“Collecting data about z/OS Resource Recovery Services problems” on page 26](#)

RRS provides a system resource recovery platform such that applications that run on z/OS can have access to local and distributed resources and have system-coordinated recovery management of these resources.

[“IMS Connect service aids” on page 417](#)

The service aids for IMS Connect include the IMS Connect Dump Formatter and trace options.

### Related reference

[“Standard IMS diagnostic information” on page 1](#)

If you contact IBM Software Support for assistance with a problem, you might be asked to collect a standard set of logs, data sets, and dumps that can help them determine the source of your problem. Collecting this information before you contact IBM Software Support will shorten the amount of time required to resolve your problem.

## Collecting data about ISC TCP/IP link problems

---

If a problem occurs on an ISC link that uses TCP/IP, you might need to collect diagnostic information from IMS, the Structure Call Interface (SCI) component of the IMS Common Service Layer (CSL), IMS Connect, TCP/IP, and IBM CICS Transaction Server for z/OS.

**Prerequisite:** Review error messages that were issued by IMS, the SCI, IMS Connect, and CICS around the time of the error to determine at which point in the ISC link the error might have occurred. If you can determine that any components are unrelated to the error, you might not need to collect information about that component.

To collect the data that is needed to diagnose a problem on an ISC link that uses TCP/IP:

- For IMS, the information that you can collect includes:
  - The IMS system console sheet
  - The IMS job log
  - The z/OS system log (SYSLOG)
  - A dump of the IMS control region

- A DC trace
- For SCI, the information that you can collect includes:
  - An SCI region dump
  - The z/OS SYSLOG from the logical partition in which SCI is running.
  - A z/OS SVC dump of the CSL address spaces
- For IMS Connect, the information that you can collect includes:
  - A dump of the IMS Connect address space
  - The IMS Connect job log
  - The z/OS SYSLOG
  - Output from the IMS Connect Recorder Trace facility
- If the problem appears to be network related, you might also need to initiate a TCP/IP packet trace to trace the IP packets flowing to and from a TCP/IP stack on the z/OS Communications Server. For more information about initiating packet traces, see *z/OS Communications Server IP Diagnosis Guide*.
- For CICS, refer to the CICS documentation for current information about collecting diagnostic information. Information that might be helpful to collect includes:
  - The CICS system console sheet
  - The CICS job log
  - The CICS message log including any DFHISnnnn messages
  - A z/OS system dump taken at the point of failure
  - A CICS internal trace

#### **Related tasks**

[“DC trace” on page 271](#)

The data communication (DC) trace enables you to obtain information about the program flow within the communications analyzer and between the analyzer and the device dependent modules (DDMs).

[“Collecting data about IMS Connect problems” on page 19](#)

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

[“Collecting data about CSL-related problems” on page 22](#)

The Common Service Layer address spaces, Open Database Manager (ODBM), Operations Manager, Structured Call Interface, and Resource Manager, produce SDUMPs for internal errors. The CSL dumps are in the SYS1.DUMP data sets.

#### **Related information**

[Collect troubleshooting data \(MustGather\) for CICS products](#)

[CICS troubleshooting and support](#)

## **Collecting data about CQS-related problems**

---

CQS problems can appear in various ways and, like the IMS control region, they can manifest themselves in the form of WAITs, HANGs, LOOPs, or some other type of internal error that results in an SDUMP being taken.

These dumps are in the SYS1.DUMP data sets. CQS can also produce LOGREC data set entries for these types of errors.

If an isolated event type within CQS encounters an error, then IBM Software Support might request additional CQS-trace level settings for the various trace types.

For a CQS WAIT problem, one or more inflight dumps might be required. Multiple dumps might need to be taken if the problem is a LOOP. If a structure rebuild or structure checkpoint related problem occurs, you will also need to dump the CQS address spaces for any CQS associated with the given structure, and save

the associated SRDS (structure recovery data set) for the CQS structure checkpoints and CQS system checkpoints.

## Collecting data about CSL-related problems

The Common Service Layer address spaces, Open Database Manager (ODBM), Operations Manager, Structured Call Interface, and Resource Manager, produce SDUMPs for internal errors. The CSL dumps are in the SYS1.DUMP data sets.

You might need to collect one or more of the following types of information to diagnose CSL related problems:

### SYSLOG

To determine the sequence of events, collect the SYSLOG from every logical partition (LPAR) where a CSL member resides. CSL address spaces issue messages that begin with "CSL"

- ODBM messages - CSLDxxxx
- OM messages - CSLOxxxx
- RM messages - CSLRxxxx
- SCI messages - CSLSxxxx
- CSL common messages - CSLZxxxx

### QUERY IMSPLEX SHOW(ALL) command output

Issue the QUERY IMSPLEX command to display the members of the IMSplex and their status.

If there are problems accessing OM or RM services, verify that at least one OM or RM is active in the IMSplex and that an active SCI resides on every LPAR where a CSL address space resides.

### Obtain z/OS SVC dumps

Obtain a z/OS SVC dump of the CSL address spaces that appear to have a problem, are waiting, or are looping. CSL dumps contain the CSL traces, which can be very useful for diagnosing CSL related problems. Dump all of the CSL address spaces that appear to have a problem with the following series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(odbm1,om1,rm1,sci1)
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In the previous example:

#### **odbm1**

An ODBM address space.

#### **om1**

An OM address space.

#### **rm1**

An RM address space.

#### **sci1**

An SCI address space.

For some CSL problems, IBM Software Support might request additional trace level settings for the various trace types.

### Related tasks

[“Collecting data about IMS Connect problems” on page 19](#)

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

### Related reference

[“CSL - Common Service Layer service aids” on page 147](#)

Common Service Layer (CSL) and Resource Manager (RM) trace records can help you analyze problems in CSL.

## Repository Server audit log records

---

If AUDIT=YES is specified in the FRPCFG member of the IMS PROCLIB data set, the Repository Server (RS) writes to the z/OS logger audit log stream name specified in the AUDIT\_LOG= parameter.

Maintaining the RS audit log is optional.

The RS audit log contains information about selected events that occur during server execution.

The audit access rule identifies the information that can be written to the audit log. The default access rule can be specified in the FRPCFG member of the IMS PROCLIB data set using the AUDIT\_DEFAULT parameter. This specification is applicable to all IMS repositories managed by the RS. The value for the AUDIT\_DEFAULT parameter can be overridden by setting the AUDITACCESS parameter in the CSLRIxxx member of the IMS PROCLIB data set.

If an audit access rule is already set for a given repository type, setting it again replaces the rule. Setting AUDITACCESS=DEFAULT removes the audit rule for the given repository type. The audit rule is then set to the default access rule specified in the FRPCFG member.

Audit log entries can be triggered in the audit log by the following events:

- RS and repository events
- ADMIN and CONTROL requests
- Registration, connection, and UOW events
- Events relating to repository members during a client member session:
  - Access failure due to a security restriction
  - Update
  - Read
  - System-level read

Refer to the FRPLGREC macro that maps the RS audit log records to view the event types and subtypes that are written and the data in each log record type.

### Related concepts

[Overview of the IMSRSC repository \(System Definition\)](#)

### Related reference

[“Log records” on page 515](#)

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

[FRPCFG member of the IMS PROCLIB data set \(System Definition\)](#)

[CSLRIxxx member of the IMS PROCLIB data set \(System Definition\)](#)

## Managing Repository Server audit log records

Issuance of Repository Server (RS) audit log records can be controlled by specifying parameters in the FRPCFG and CSLRIxxx members of the IMS PROCLIB data set and through the **F repositervername, AUDIT** RS command.

Auditing can be enabled for the RS to connect to the z/OS log stream by specifying AUDIT=Y in the FRPCFG member of the IMS PROCLIB data set, but no audit records are written if AUDIT\_LEVEL=NONE is specified.

Auditing can be restarted after an error during RS initialization if AUDIT\_FAIL=CONTINUE is specified.

You can also dynamically change the value specified for the AUDIT\_LEVEL parameter in the FRPCFG member by issuing the RS command **F repositervername, AUDIT**.

You can control which types of events and member access are audited during client member sessions by specifying the `AUDIT_DEFAULT=` parameter in the `FRPCFG` member or the `AUDITACCESS=` parameter in the `CSLRIxxx` member. Audit access can also be modified through the **UPDATE RM** command. An audit access rule applies to all members of a specified repository type.

A read request from an authorized client that is done as a part of the update request is identified as a *system read* request. With an audit access rule of `READ`, system read requests do not cause a read audit record to be generated. With an audit access rule of `SYSTEMREAD`, all read requests, including system read requests, are audited.

### **Related concepts**

[Overview of the IMSRSC repository \(System Definition\)](#)

### **Related reference**

[FRPCFG member of the IMS PROCLIB data set \(System Definition\)](#)

[CSLRIxxx member of the IMS PROCLIB data set \(System Definition\)](#)

[F reposervername,AUDIT \(Commands\)](#)

## **How the Repository Server handles z/OS logger errors**

The Repository Server (RS) uses the ENF48 exit to detect when system logger resources become unavailable or available.

This process enables the RS to resume logging when transient logger errors are resolved.

If `AUDIT_FAIL=CONTINUE` is specified in the `FRPCFG` member of the IMS PROCLIB data set, during RS startup, the RS starts after an error and no audit log is enabled.

If `AUDIT_FAIL=ABORT` is specified, during RS startup, the RS terminates on an error.

During a client request, if `AUDIT_FAIL=CONTINUE` is specified, the RS continues processing as if the audit log is not enabled.

If `AUDIT_FAIL=ABORT` is specified, the client request is rejected.

### **Related concepts**

[Overview of the IMSRSC repository \(System Definition\)](#)

### **Related reference**

[FRPCFG member of the IMS PROCLIB data set \(System Definition\)](#)

## **Printing Repository Server audit log records**

To print the audit log records from the Repository Server (RS) audit log stream on the z/OS system logger, use the IMS File Select and Formatting Print utility (DFSERA10) with exit routine CSLRERA3.

### **DD statements**

The DD statements for printing RS audit log records are:

#### **STEPLIB DSN=**

Points to `IMS.SDFSRESL`, which contains the IMS File Select and Formatting Print utility, `DFSERA10`.

#### **SYSPRINT**

Describes the output data set to which the formatted print records and control messages are to be directed. `SYSPRINT` is usually defined as `SYSOUT=A`. `DCB` should not be specified on the `SYSPRINT` DD.

#### **SYSUT1 DSN=**

Points to the RS audit log stream name that is specified on the `AUDIT_LOG=` parameter in the `FRPCFG` member of the IMS PROCLIB data set.

### **Control statements**

The control statements for printing the RS audit log records are:

## H=

Specifies the number of log records to print. H=EOF specifies to print all of the log records.

## EXITR=

Identifies the Resource Manager (RM) audit log record exit routine that is called to format each log record. EXITR=CSLRERA3 specifies to print the records in a memory dump format, including the record type and time-stamp information for each record.

### Limiting log data to a specific time range

To limit the log data to a specific time range, use the FROM and TO parameters on the SUBSYS statement, as shown in the following example. This DD card prints log records from 11:00 to 12:00 on day 42 of the year 2010:

```
//SYSUT1 DD DSN=SYSLOG.REPO.AUDIT.LOG
//
// SUBSYS=(LOGR,IXGSEXIT,
// 'FROM=(2010/042,11:00:00),TO=(2010/042,12:00:00)'),
// DCB=(BLKSIZE=32760)
```

Dates and times are specified in Greenwich mean time (GMT). The seconds field in the time value is optional. To use local dates and times, add the LOCAL keyword, as shown in the following example:

```
//SYSUT1 DD DSN=SYSLOG.REPO.AUDIT.LOG,
//
// SUBSYS=(LOGR,IXGSEXIT,
// 'FROM=(2007/042,11:00:00),TO=(2007/042,12:00:00),LOCAL'),
// DCB=(BLKSIZE=32760)
```

### Sample

The following JCL shows what is required to print RS log records from the RS audit log stream:

```
//CSLERA1 JOB MSGLEVEL=1,MSGCLASS=A,CLASS=K
//STEP1 EXEC PGM=DFSERA10
//STEPLIB DD DISP=SHR,DSN=IMS.SDFSRESL
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=SYSLOG.REPO.AUDIT.LOG,
// SUBSYS=(LOGR,IXGSEXIT),
// DCB=(BLKSIZE=32760)
//SYSIN DD
CONTROL CNTL H=EOF
OPTION PRINT EXITR=CSLRERA3
END
//
```

### Related concepts

[Overview of the IMSRSC repository \(System Definition\)](#)

### Related reference

[File Select and Formatting Print utility \(DFSERA10\) \(System Utilities\)](#)

## Collecting data about ESAF and DB2 ESS interface problems

ESAF (External Subsystem Attach Facility) interface problems can be diagnosed by using the external trace data set. You can use the IMS /TRACE command to direct and control the tracing of internal IMS events.

The IMS external subsystem (ESS) trace impacts performance. Activate the trace only when you notice a problem or if you need to re-create a problem. IBM software support may ask you to provide dumps of IMS CTL, z/OS SVC and the IMS online log data set.

To document problems that involve the Db2 for z/OS ESS interface:

1. Use the following **TRACE** command to turn on the IMS ESS trace and to direct its output to the external trace data set:

```
/TRACE SET ON TABLE SUBS OPTION LOG
```

2. Obtain dumps of the IMS CTL and involved dependent regions, before and after the failure, by issuing this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(j1,j2,j3,j4,j5),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

3. Obtain a z/OS SVC dump of the DB2® MSTR and DBM1 regions by issuing this series of commands:

```
DUMP COMM=(dump title)
R id JOBNAME=(dbtmstr,dbwdbm1),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

4. Save the IMS online log data set that was active during the failure because IMS TYPE5501, 08, 07, 56 and other log records can be critical to diagnosis. The IMS TYPE5501 records are updated by DB2. The internal buffer for these records is stored at the location described by the CDE entry named WAL in the IMS regions.
5. If the IMS monitor is started, issue the following command to monitor the IMS data set:

```
/TRACE SET ON MONITOR ALL
```

## Collecting data about database problems

---

The first step to diagnosing an IMS problem is to collect data about the problem. If you call an IBM service representative, you will be asked for documentation about the problem.

For database problems, obtain the following information:

- The damaged database data set.
- The database image copy of the damaged database in a state prior to damage.
- The image copy of logically related databases.
- The IMS OLDS from all data-sharing IMS subsystems.
  - Save from the last good database image copy of damaged database.
- If possible, and not already set, use the following IMS commands and save the output:

```
/TRA SET ON TABLE DLI OPTION LOG
```

and

```
/TRA SET ON TABLE LOCK OPTION LOG
```

- The SYSOUT from the Pointer Checker jobs for the damaged database.
- The SYSOUT from batch jobs that accessed the damaged database.
- The LIST.RECON and LIST.HISTORY DBD from the damaged database.
- The SMF 60, 62, and 64 records from all data-sharing systems back to the last good image copy of damaged database.
- For VSAM data sets:
  - Issue IDCAMS LISTC for the damaged VSAM data set.
  - Issue IDCAMS DIAGNOSE and IDCAMS EXAMINE for the damaged VSAM KSDS data sets.

## Collecting data about z/OS Resource Recovery Services problems

---

RRS provides a system resource recovery platform such that applications that run on z/OS can have access to local and distributed resources and have system-coordinated recovery management of these resources.

If you use RRS with your IMS system:



- Take an SVC dump of the standard IMS regions using one of the methods discussed earlier: CTL, DL/I, DBRC, suspicious dependent regions, IRLM, and so on.
  - In addition, include the z/OS RRS address space and the z/OS logger address space (IXGLOGR).
  - Consider setting the following SLIP trap to supplement standard IMS/RRS ABENDU0711 diagnostics:

```
SLIP SET,C=U0711,JOBLIST=(ctljname,rrsjname,IXGLOGR),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ,LPA,ALLNUC),
ID=nnnn,DSPNAME=('RRS'.*),END
---
```

In the previous example:

**ctljname**

IMS control region job name

**rrsjname**

RRS region job name

**nnnn**

Name used to recognize this SLIP

- Turn on the RRS component trace.
  - Place the following statements in the CTIRRSxx PARMLIB member:

```
TRACEOPTS
ON
BUFSIZE(500M)
OPTIONS('EVENTS(URSERVS,LOGGING,CONTEXT,EXITS,STATECHG,RRSAPI,RESTART)')
```

- Place the following statement in the z/OS COMMNDxx SYS1.PARMLIB member:

```
TRACE CT,ON,COMP=SYSRRS,500M,PARM=CTIRRSxx
```

**Note:** This statement allows the trace to be active at IPL.

- Use the D TRACE,COMP=SYSRRS command to view the current trace setting.
- RRS component trace is present in the RRS address space.
- Format the trace by using IPCS CTRACE COMP(SYSRRS) FULL command.
- Save the IMS OLDS
  - IMS 67D0 log records are produced for some ABENDU0711 abends.
    - Print these records by using the IMS utility programs DFSERA10 and DFSERA30.
  - Other RRS related records that are produced:
    - TYPE4098 - Checkpoint for RRS log name.
    - TYPE5615 - IMS restarted with RRS.
    - TYPE5616 - Start of protected UOW.
  - Issue two or three IMS DISPLAY UOR ALL commands to show status about the IMS UOR for protected resources on the RRS recovery platform.
    - The RRS-URID provided by RRS and the IMS recovery token are displayed.
- If the problem is recreatable, then:
  - Turn on the RRS component trace:

```
TRACE CT,ON,500M,COMP=SYSRRS
nn,OPTIONS=(EVENTS(ALL)),END
```

- When the problem has been recreated, stop the component trace:

```
TRACE CT,OFF,COMP=SYSRRS
```

- RRS component trace is present in the RRS address space.
- Format the trace by using the `IPCS CTRACE COMP(SYSRRS) FULL` command.
- Issue two or three `IMS DISPLAY UOR ALL` commands to show status about the IMS UOR for protected resources on the RRS recovery platform.
  - The RRS-URID provided by RRS and the IMS recovery token are displayed.

### Related tasks

[“Collecting data about IMS Connect problems” on page 19](#)

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

## Collecting data about MSC-related problems

---

If you experience IMS Multiple Systems Coupling (MSC) related problems, you can collect diagnosis data with SVC dumps.

If you use IMS MSC and experience a related problem, complete the following tasks:

- Create an SVC dump of the coupled IMS regions (minimally, the CTL regions, but the problem might reside in any IMS-related region). In addition, ensure that the VTAM address space is also included. Create this dump as close to the time of the problem as possible, before you try to fix the problem.
- Save the IMS OLDS for both coupled systems from the time of the message creation.
- To show the status and queue counts for the logical link, issue the type-1 commands **/DISPLAY LINK ALL** and **/DISPLAY LINK ALL MODE**, or issue the type-2 command **QUERY MSLINK NAME(*linkname*) SHOW(ALL)**.
- If the problem is recreatable:

- Turn on the VTAM Internal Trace for both coupled systems:

```
F NET,TRACE,TYPE=VTAM,OPT=(API,PIU,MSG),DSPSIZE=5,SIZE=999
```

- Using the options shown above, the VIT (VTAM internal trace) is created in a VTAM data space. After the problem has been recreated, the dump parameters should also include the VTAM data space:

```
DSPNAME=('NET'.ISTITDS1)
```

- Turn on the MSC LINK trace for both coupled systems by issuing either the type-1 command `/TRACE SET ON LINK link# LEVEL 3 MODULE ALL` or the type-2 command `UPDATE MSLINK NAME(linkname) START(TRACE)`.

- The type-2 command `UPDATE MSLINK NAME(linkname) START(TRACE)` uses the same level and module settings that were used the last time the command `/TRACE SET ON LINK link#` was issued. If a `/TRACE SET ON LINK link#` command has not been issued since the last cold start, this command defaults to `MODULE ALL` and `LEVEL 4`.

---

## Chapter 3. Collecting data about abends by using IMS abend search and notification

IMS abend search and notification enables IMS to send an email or text message to a designated email address when an abend occurs.

When an abnormal termination (or *abend*) occurs, IMS sends a message that contains an abend code to an operator's console or to the master terminal operator (MTO). This process delays a response because the person who can respond to the abend might not be near the console when the message is sent. Therefore, action in response to the abend is delayed until the message reaches the correct person.

IMS abend search and notification enables IMS to send an email or text message to a designated email address when an abend occurs, in order to:

- Notify the correct person of an abnormal termination (abend).
- Provide a web address (URL) to the location of additional informational resources, such as IMS product documentation, technical notes in an IBM technical support database, and information in the preventive service planning (PSP) database.

You can also use IMS abend search and notification to dynamically research abends and build links to web addresses that provide information that relates to the abend, such as online product documentation and technical support databases.

---

### Enabling IMS abend search and notification

Before you can use IMS abend search and notification to search online documents and technical support databases for information related to IMS abends, you must enable it.

Complete the setup procedures for the IMS abend search and notification, as described in "Setting up IMS for diagnostics" in *IMS Version 14 System Definition*.

---

### Researching information about abends dynamically

You can use IMS abend search and notification to dynamically generate emails for specific abends, specify research criteria, and replicate the search criteria that IMS used in a particular abend event and generate an email.

To research information about abends dynamically:

1. Start IMS abend search and notification by using one of the following methods:

Option	Description
<b>Select IMS abend search and notification from the IMS Application Menu.</b>	The IMS Abend Search and Notification panel is displayed.
<b>From the ISPF option 6, enter the following command, where <i>hlq</i> is the high-level qualifier used to install IMS:</b>  <code>exec 'hlq.SDFSEXEC(DFSRASNO)' 'HLQ(hlq)'</code>	The IMS Abend Search and Notification panel is displayed.

2. Type 2 in the IMS ASN On-Demand Interface field and press **Enter**.

The IMS Abend Search and Notification panel - on demand interface panel is displayed, as shown in the following figure.

```

-----
                IMS Abend Search and Notification - on demand interface
COMMAND ==>
*Product Name . . . . . _____ REQUIRED (example: IMS)
Provide one or more of the following web search arguments
PSP for FMID . . . . . _____ (example: JMK7701)
Abend Code . . . . . _____ (example: S0C4)
Return Code (RC) . . . . . ____ (example: 44)
Module Name. . . . . _____ (example: DFSSAMP0)
APAR Number (PE or other). . . _____ (example: PQ99999)
Message ID . . . . . _____ (example: EFS555i)
Generic Search Argument . . . _____ (example: SQL+OVERFLOW)
Recipient Information
  Recipient email Address. . . _____
                                     (example: name@company.com)
  Specify Additional Addresses? _ (Y-Yes/N-No)
JOB JCL Statement. . . . . _ (E-Edit/Y-Yes/N-No)
-----

```

*Figure 2. IMS Abend Search and Notification - on demand interface panel*

3. Type your search criteria and press Enter.

---

## Chapter 4. How to search problem-reporting databases

After you obtain background information about the problem you are diagnosing, you can then use that information to create search arguments to search problem-reporting databases for known problems that describe an aspect of a program failure.

You use keyword strings to search an IBM Technical Support database for documents such as Authorized Program Analysis Reports (APARs), Preventative Service Planning buckets, or Technotes for information about the resolution of reported problems. If the search is successful, you will find a similar problem description, and usually a fix or recommendation. If the failure is one that is not known, you will use the keywords to describe the failure when you contact IBM Product Software Support for assistance.

Some optional search tools might require keywords in a structured database (SDB) format.

---

### Developing search arguments

A keyword describes one aspect of a program failure. A set of keywords, called a *keyword string*, describes a specific problem in detail. Because you use a keyword string to search a database, a keyword string is also called a *search argument*.

The keywords you use to search for problems in IMS are:

- The component identification

This is the first keyword in the string. A search of the database with this keyword alone detects all reported problems for that version of IMS.

- The type of failure

The second keyword specifies the type of failure that occurred. Its values can be:

- ABENDxxx
- ABENDUxxxx
- DOC
- PERFM
- MSGx
- INCORROUT
- WAIT/LOOP

- Symptom keywords

These can follow the keywords above and supply additional details about the failure. You select these keywords as you proceed through the type-of-failure keyword procedure that applies to your problem.

Add symptom keywords to the search argument gradually so that you receive all data matches or *hits*, which are problem descriptions that might match your problem. If you receive too many problem descriptions to examine, you can add AND or OR operators to additional keywords in various combinations to the keyword string to reduce the number of hits.

- Dependency keywords

These are program or device dependent keywords that define the specific environment that the problem occurred in. When added to your set of keywords, they can help reduce the number of problem descriptions you need to examine. See [“Dependency keywords”](#) on page 63 for a list.

## Creating a search argument

After you have performed some analysis on the problem you are diagnosing, you can then use that information to search problem reporting databases. To do that, you create a search argument comprised of keyword strings. If that search technique is unsuccessful, you can prepare an Authorized Program Analysis Report (APAR).

To build the keyword string and search the IBM software support database for a problem similar to the one you are experiencing, follow these steps:

1. Begin with [“Component identification keyword procedure” on page 32](#) to determine the failing IMS component.
2. Follow the sequential steps in one of the "Type-of-Failure Keyword" procedures until you build a keyword string.
3. Go to [“Searching the database” on page 64](#), to learn how to search the IBM software support database with your completed string.
  - a) Optional: Use the [“IMS keyword dictionary” on page 61](#), which provides guidance on translating free-form keywords into structured database (SDB) format.
  - b) If needed, you could use [“Dependency keywords” on page 63](#), which are used to narrow search arguments.
4. If your search is unsuccessful, go to [“Procedures for preparing an APAR” on page 65](#).

## Selecting the keywords

You select the proper keywords to search the IBM Software Support database for a problem similar to the one you are experiencing. The keywords you select depend on the component that is experiencing the problem and the type of failure that occurred.

### Related tasks

[“Analyzing DRA problems” on page 388](#)

To analyze DRA problems, first investigate any external conditions that might have caused the problem. If you can eliminate external causes, an unexpected DBCTL return code or another IMS function might have caused the problem.

## Component identification keyword procedure

Use a component identification number with at least one other keyword to search the IBM software support database.

The component identification numbers for IMS appear in the following table.

*Table 2. IMS component identification numbers*

Identification number	Description
5635A05	IMS Services Database Manager Transaction Manager Extended Terminal Option (ETO) Recovery-level Tracking Database-level Tracking
569516401	Internal Resource Lock Manager (IRLM) version 2

Some of the procedures in these topics contain offsets within control blocks. Be aware that maintenance might change the offsets in these control blocks. For a current version of the layout of the control blocks for your system, assemble the DFSADSCT module that is in the IMS.ADFSSMPL library.

### Related concepts

[“PERFM procedure” on page 37](#)

Most performance problems are related to system tuning and should be handled by system programmers.

### **Related tasks**

[“Type-of-failure keyword” on page 33](#)

You choose the keyword that best describes the program failure you experienced, and then go to the procedure for that type of failure.

## **Type-of-failure keyword**

You choose the keyword that best describes the program failure you experienced, and then go to the procedure for that type of failure.

### **Related reference**

[“Component identification keyword procedure” on page 32](#)

Use a component identification number with at least one other keyword to search the IBM software support database.

### **ABENDxxx procedure**

Use this procedure when the system terminates abnormally with a system abend completion code.

#### **Keyword: ABENDxxx**

Compare the completion code and PSW address in both the z/OS-formatted section of the dump and the IMS-formatted section of the dump. If the code and address do not match, use only the data from the IMS-formatted section, because the system dump data might be produced if an abend occurs during abend processing.

Replace the xxx part of the ABENDxxx keyword with the abend code from either the termination message or the abend dump.

#### **Keyword: RCxx**

This keyword applies only if the abend has an associated return code as described in *z/OS MVS System Commands*.

Replace the xx part of the RCxx keyword with the return code.

#### **Keyword: module name**

You can determine the name of the module that received the abend in one of the following ways:

- Check both the dump title and message DFS629I, which might contain the name of the module that ended abnormally.
- Check the summary section, called "Diagnostic Area", in the offline formatted dump.
- Find the PSW address at the time of abend. Locate this address in the storage section of the dump, and scan backward through the eye catchers until you find a module identifier.

### **Module-specific keyword: Failing instruction, register**

You can use these module-specific keywords to further narrow the field of hits.

#### **Failing Instruction**

The PSW address at the time of abend usually points to the next instruction to be executed. If ABEND0C4 or ABEND0C5 occurs and the INTC (interrupt code) field on the PSW AT ENTRY TO ABEND line contains X'0011' (segment exception) or X'0010' (page translation exception), the PSW points directly to the instruction that failed.

#### **Register in Error**

Examine the code near the failure to determine the register that is invalid or in error, if possible.

For example, if the failing instruction is BALR (05EF), look at registers 14 (E) and 15 (F). If register 15 (F) contains zeros, the program cannot branch to that location. Therefore, register 15 is in error.

In performing system-abend analysis, another module might have passed the register in error. You might be able to determine this by looking at the registers on entry to the failing module. If the incorrect value is in one of the registers, that value might have been passed.

### Module-specific keyword: Search argument example

If, for example, ABEND0C4 occurred in IMS module DFSFXC30 on a BALR (05EF) instruction because register 15 (F) contained zeros, use the following search argument:

```
5655J3800 ABEND0C4 DFSFXC30
```

For a structured database search, use the following search argument:

```
PIDS/5655J3800 AB/S00C4 RIDS/DFSFXC30
```

With this search argument, you might receive numerous hits, which would most likely include the APAR that describes your problem. You can add module-specific keywords to narrow the field of hits received. Use the OR operator with these additional keywords at first.

The additional keywords for this example are:

```
BALR | R15 ZEROS
```

For a structured database search, use the following search argument:

```
OPCS/BALR | REGS/GR15 VALU/H00000000
```

### Related concepts

[“ABENDUxxxx procedure” on page 34](#)

Use this procedure when an IMS user abnormal termination occurs. For user abends, you must gather more information before calling IBM Software Support.

### ABENDUxxxx procedure

Use this procedure when an IMS user abnormal termination occurs. For user abends, you must gather more information before calling IBM Software Support.

A message usually precedes a user abend. First, find the message and then the abend code in *IMS Version 14 Messages and Codes, Volume 1: DFS Messages* or *IMS Version 14 Messages and Codes, Volume 2: Non-DFS Messages*. Then, if you need further diagnostic information (such as return codes) that you can use to build the search argument, or information about why the abend was issued, refer to the *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*.

If you cannot solve the problem by using the information in the *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*, develop a search argument.

### ABENDUxxxx keywords

Replace the xxxx part of the ABENDUxxxx keyword with the user abend code from either the termination message or the abend dump. User abends are always represented in decimal.

### Keyword: module name

You can determine the name of the module that received the abend in either of the following ways:

- Check both the dump title and message DFS629I, which might contain the name of the module that ended abnormally.
- Use the PSW address at the time of abend. You can find this address in the IMS-formatted section of the dump under the diagnostic area or in the z/OS-formatted section. From the PSW address, scan backward through the eye catchers until you find a module identifier.



Use the module name in the search argument for standard user abends only. For pseudoabends, do not include the module name as part of the argument. *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes* indicates whether the abend is a pseudoabend or a standard abend.

### Abend-specific keywords

By examining the information in *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*, you might gather additional keywords that can be pertinent to the problem, such as:

- User call function
- Internal call function
- Database organization
- Messages

Replace the xxxxxx part of keyword MSGxxxxxx with the actual message identifier (for example, the keyword for message DFS053I is MSGDFS053I).

- Return codes

Replace the xx part of keyword RCxx with the associated hexadecimal return code (for example, the keyword for return code C is RC0C).

- Function codes

Replace the xxxx part of keyword FCxxxx with the associated hexadecimal function code (for example, the keyword for function code 13 is FC0013).

### Search argument example

If, for example, ABENDU3046 occurred in IMS module DFSPCC20 with message DFS3624I indicating function code 291 and return code 4, the search argument to use is:

```
5655J3800 ABENDU3046
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 AB/U3046
```

With this search argument, you might receive numerous hits, which would most likely include the APAR describing your problem. You can add keywords from the section [“Type-of-failure keyword”](#) on page 33 to narrow the field of hits received. It is a good idea to use the **OR** operator on these additional keywords at first. Module name DFSPCC20 is not included as part of the search argument because ABENDU3046 is a pseudoabend.

The additional keywords for the above scenario are:

```
MSGDFS3624I | RC04 | FC0291
```

For a structured database search, use this search argument:

```
MS/DFS3624I PRCS/00000004 OPCS/0291
```

### Additional documentation

IBM Software Support might ask you to obtain certain information to determine and resolve the problem. At times you might need to create the problem again in order to gather this documentation.

For database problems, ensure that you have access to the following documentation before calling IBM Software Support:

- A dump of the problem
- DBDGENS

- PSBGENs
- A copy of the databases involved in the error
- Logs and archive tapes that might have activity against the databases
- Output from both the DL/I and LOCK traces
- When tracing to the log, a printout of the traces
- A current CDS list or a current SMP/E target zone
- A current assembly listing of DFSADSCCT from IMS.ADFSSMPL (control block DSECTs)

Problems can be resolved more quickly if the documentation listed above is available.

### IRLM procedure

Use this procedure when the IRLM terminates abnormally.

1. Locate the PSW and register contents at entry to the abend either from the software LOGREC entry or from the RTM2WA summary in the formatted section of the SDUMP.
  - a. If the PSW is not within an IRLM module (prefixed with DXR), determine the system component in which the abend occurred and use the diagnostic procedure for that component to resolve the problem.
  - b. If the RTM2WA summary entry shows that the IRLM was terminated by an abend completion code of U2017, U2018, U2019, U2020, U2022, U2023, U2024, U2025, U2027, U2031 (X'7E1', X'7E2', X'7E3', X'7E4', X'7E6', X'7E7', X'7E8', X'7E9', X'7EB', or X'7EF'), the IRLM task was terminated because of an error either in a subtask or in an SRB related to the IRLM. To diagnose the problem, use the software LOGREC entry or the RTM2WA summary entry for the original error in the subtask or related SRB.
2. Register 12 normally contains the base register contents for the module that was in control at the time of the error.
3. Register 9 normally contains the address of the RLMCB if the error occurred during IRLM processing.
4. Using the module name, find the function keyword and locate the function and subfunction keywords.

### Examples

An example of a search argument for an IRLM problem is:

```
569516401 ABEND0C4 DXRRL200
```

For a structured database search, an example is:

```
PIDS/569516401 AB/S00C4 RIDS/DXRRL200
```

### Related tasks

[“ABENDxxx procedure” on page 33](#)

Use this procedure when the system terminates abnormally with a system abend completion code.

### DOC procedure

Use this procedure if you find a deficiency in documentation through omission or inaccuracy.

### Keyword: order-number

Your feedback is important in helping us provide the most accurate and highest quality information. If you have any comments about this or any other IMS information, you can take one of the following actions:

- From any topic in IBM Knowledge Center at [www.ibm.com/support/knowledgecenter](http://www.ibm.com/support/knowledgecenter), click the **Feedback** link at the bottom of the page and complete the form.

- Send your comments by email to [imspubs@us.ibm.com](mailto:imspubs@us.ibm.com). Be sure to include the title, the part number of the title, the version of IMS, and, if applicable, the specific location of the text on which you are commenting (for example, a page number in the PDF or a heading in IBM Knowledge Center).

Corrections resulting from readers' comments are included in future editions of the manual, but are not included in the software support database.

If a problem can have severe results or cause lost time for many other users, contact IBM Software Support to initiate a documentation change.

APARs are not generally accepted for documentation errors. However, APARs that correct a programming error can result in documentation changes.

Use this keyword to search for all changes to a specific manual. The format for the order-number is *ppnnnnnee*, where *pp* is the alphabetic prefix, *nnnnnn* is the 6-digit base publication number, and *ee* is the edition number. For example, the order number for *IMS Version 14 Messages and Codes, Volume 1: DFS Messages* is GC18-9712-00. Replace *ppnnnnnee* with GC18971200. The edition number is optional. To broaden the search to include all editions of a publication, either omit the edition number or replace it with two asterisks (\*\*).

### **Search argument example**

Use this search argument to search for all changes to any edition of *IMS Version 14 Messages and Codes, Volume 1: DFS Messages*:

```
5655J3800 GC189712**
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 PUBS/GC269712**
```

You can add more keywords to narrow the search. For example, if you cannot find message DFS3007 in *IMS Version 14 Messages and Codes, Volume 1: DFS Messages*, add this keyword to the above search argument:

```
MSGDFS3007
```

For a structured database search, use this search argument:

```
MS/DFS3007
```

If you do not find an APAR that adds message DFS3007, you can report the omission to IBM by clicking the **Feedback** link at the bottom of any topic in IBM Knowledge Center.

### **PERFM procedure**

Most performance problems are related to system tuning and should be handled by system programmers.

### **Keyword: PERFM or PERFORMANCE**

Always use the keywords PERFM and PERFORMANCE for performance problems. You should use the **OR** operator to link them together in the search argument.

You can use the following search argument to check for all performance APARs in IMS Fast Path:

```
5655J3800 PERFM | PERFORMANCE FAST | PATH | FASTPATH
```

For a structured database search, you can use this search argument:

```
PIDS/5655J3800 PERFM | PERFORMANCE RIDS/FASTPATH
```

You can add the **OR** operator to the general component identifier together with the Fast Path component identifier. With this search argument, the resulting number of hits could be very large, but would include APARs describing performance problems in Fast Path.

You can add more keywords to narrow the number of hits. For example, if the performance problem occurs because of an excessive number of file opens and closes, you can add the **OR** operator with the following keywords to the above search argument:

```
OPEN | CLOSE
```

For a structured database search, use this search argument:

```
PCSS/OPEN | PCSS/CLOSE
```

If you cannot find an appropriate APAR with these search arguments, contact IBM Software Support.

Appropriate documentation for performance problems might include:

- Traces, such as DL/I, lock, dispatcher, scheduler, external subsystem, and others, depending on the area of the performance problem
- Dumps of the problem during the period of performance degradation
- Dumps of the problem during normal periods, for comparison
- DB or IMS Monitor reports during the performance problem period
- DB or IMS Monitor reports during normal operations, for comparison
- Copy of the IMS log during the performance problem period
- Copy of the IMS log during the normal period, for comparison

If a coordinator controller (CCTL) application program experiences a performance problem in a Database Control (DBCTL) environment, you might need the following documentation in addition to that listed above:

- Any CCTL traces or monitor reports
- A dump of the CCTL subsystem during the period of performance degradation

#### **Related reference**

[“Component identification keyword procedure” on page 32](#)

Use a component identification number with at least one other keyword to search the IBM software support database.

#### **MSG procedure**

If, after analyzing the message, you believe that the message should not have been issued or describes an error condition, use the MSGxxxxxxx keyword.

#### **Keyword: MSGxxxxxxx**

Replace the xxxxxxxx part of keyword MSGxxxxxxx with the actual message identifier (for example, the keyword for message DFS0861 is MSGDFS0861).

#### **Search argument examples**

If, for example, you receive message DFS3401I RACF NOT AVAILABLE, and you determine that RACF is indeed available in your system, the search argument to use is:

```
5655J3800 MSGDFS3401I
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 MS/DFS3401I
```

### **Incorrupt procedure**

INCORROUT is when either output is missing, or output is incorrect.

#### **Keyword: INCORROUT**

Use this procedure to determine the appropriate search argument.

Always use the keyword INCORROUT for problems related to incorrect or missing output.

#### **Keyword: utility module name**

If the incorrect or missing output is associated with a utility, use the utility module name as a keyword. For example, if output from the File Select and Formatting Print utility (DFSERA10) is incorrect, use DFSERA10 as a keyword.

#### **Keyword: command**

If the output from a command is missing or incorrect, use the first three letters of the command as a keyword. Also, you should use the **OR** operator in the search argument with CMDxxx, where xxx is replaced by the first three letters of the command.

If, for example, the DISPLAY command provides incorrect output, use the following search argument:

```
5655J3800 INCORROUT DIS | CMDDIS
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 INCORROUT PCSS/DIS
```

If applicable, you can add the output column or heading as a keyword in the search argument.

#### **Keywords: columns, headings, fields**

Whenever possible, you can add additional keywords to narrow the field of search results. If a particular heading, field name, or column is incorrect, use it as a keyword. For example, if the deadlock event summary section of the IMS Monitor report (DFSUTR20) is incorrect for the DMB NAME column, use the following search argument:

```
5655J3800 INCORROUT DFSUTR20 DEADLOCK | DMB
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 INCORROUT RIDS/DFSUTR20  
PCSS/DEADLOCK PCSS/DMB
```

If you receive too many search results, remove the **OR** operator (|) to focus the selection.

#### **Keyword: database type or call**

If the incorrect output is a database record, use the database type (such as VSAM, HDAM, or HIDAM) and possibly the call (such as GU, ISRT, or DELETE).

### **Additional diagnostics**

This section does not apply to a Database Control (DBCTL) environment.

If the output is a transaction message produced as output from an application program, perform the steps below. (The message can be directed either to a terminal or to another application program. This is called a program switch.)

1. If the output is missing, continue with this step; otherwise, go to step 2.
  - a. When the output is missing, determine if the transaction is being scheduled.

- Issue the /DIS ACTIVE command to make sure the transaction is not stopped.
- Then issue the /DIS TRAN command to find out if the transaction is scheduled.

QCT should decrease by at least one each time the transaction is scheduled and terminates normally.

If the transaction is not being scheduled, go to step 1f.

- b. Determine if the message is being enqueued to the proper output destination by issuing one of the following commands:

- Issue the /DIS TRAN command (for program switch). ENQCT should increase.
- Issue the /DIS LTERM command (for output to terminal). ENQCT should increase.

If the message is not being enqueued to the proper output destination, go to step 1e.

- c. If the output destination is another application program, it should be scheduled as a result of the message enqueue.

If the transaction is scheduled but there is no input, the problem is probably within the SYS function.

If the application program is not scheduled, go to step 1f.

- d. If the output destination is a terminal, verify that I/O errors did not prevent the message from being sent. Take both of the following actions.

- Review the console log for I/O error messages.
- Issue the /DIS LTERM command for operational status.

If you detected valid I/O errors, stop here and correct the hardware problem. Otherwise, the problem is probably within the TM function. Stop here and build your search argument.

- e. Determine if the application program is using the proper PCB for the ISRT call.

- Force a dump in the application program at the time of the ISRT call.

If the proper PCB is being used, the problem is probably within the SYS function. Stop here and build your search argument. Otherwise, stop here and correct the application program.

- f. Determine if the resources necessary to schedule the application program are available.

- Issue the /DIS ACTIVE command for the active region.
- Issue the /DIS SUBSYS ALL command for all external subsystems connected to or in the process of being connected to IMS.
- Issue the /DIS TRAN command to make sure the transaction is not stopped.
- Issue the /DIS DATABASE command to determine if the necessary databases are available.

If a resource is not available, stop here and make it available. Otherwise, force a console dump. Use the PST ANALYSIS step in procedure “[WAIT/LOOP procedure](#)” on page 41 to determine the reason the transaction is not being scheduled. Stop here and build your search argument using that information.

2. If the incorrect data is input to an application, perform this step, otherwise go to step 3.

- a. Verify the text data in the X'01' log record to determine if the data reached IMS properly.

If the data did not reach IMS properly, go to step 2c.

- b. Force a dump in the application program immediately after the application program GU call, in order to determine if the data reached the I/O area correctly.

If the data did not reach the I/O area correctly, the problem is probably within the SYS function. Stop here and report the problem. Otherwise, the application program received the data correctly. Stop here.

- c. Start the line or node trace and verify the data in the X'6701' log record to determine if the data reached the input TP buffer correctly.

If the data reached the input TP buffer correctly, the problem is probably within the DC function. Stop here and report the problem. Otherwise, if the data did not reach the input TP buffer correctly, the problem is probably a hardware or an operating system failure. Stop here and correct the hardware or operating system problem.

3. Determine if the message data is actually incorrect rather than merely formatted incorrectly.

- Compare received data with expected data.
- Check MFS blocks for correct format definition.
- a. Force a dump in the application program just before the ISRT call to determine whether the data is correct in the I/O area at the time of the ISRT.

If the data in the I/O area is incorrect, the problem is probably in the application program. Stop here and correct the application program. Otherwise, continue. Verify the text in the X'03' log record to determine whether the data reached the message queue correctly.

If the message did not reach the message queue correctly, the problem is probably within the SYS function. Stop here and build your search argument. Otherwise, continue.

- b. Start the line or node trace and verify the data in the X'6701' log records, in order to determine if the data reached the output TP buffer correctly.

If the data did not reach the output TP buffer correctly, the problem is probably within the DC function. Stop here and build your search argument. Otherwise, if the data is correct in the output TP buffer, but not at the terminal, the problem is probably a hardware or operating system failure. Stop here and correct the hardware or operating system problem.

### **IRLM problems**

Incorrect output from the IRLM can be divided into the following three areas:

- Incorrect information on a display status command
- Locks granted when locks should not be granted
- Locks not granted when locks should be granted

For help in diagnosing these problems, call the IBM Support Center. A support representative will tell you what type of documentation to gather.

### **WAIT/LOOP procedure**

The procedures for the WAIT and LOOP keywords are combined because the WAIT and LOOP symptoms might not be distinguishable at first.

#### **Determine the type of WAIT or LOOP that is in progress**

Use the following procedure to determine the type of WAIT or LOOP occurring, and to find the appropriate keywords for the problem.

Maintenance might change the offsets in these control blocks. For a current version of the control blocks, assemble DFSADSC.

1. Is IMS being shut down?
  - If the operator issued a CHECKPOINT DUMPQ, PURGE, or FREEZE command before the manifestation of the wait/loop, go to [“Shutdown processing” on page 55](#).
  - If IMS is not being shut down, continue with the next step.
2. Determine whether IMS was in selective dispatching mode.

Find the dispatch work areas in the formatted dump. The dispatch work areas are created using the DISPATCH or ALL IMS dump formatting options. The dispatch work area eye catcher is \*\*DSP.

The selective dispatch bits are in the SFLAGS field in the DYNAMIC SAP EXT. section, where the X'xxxxxx8x' bit represents selective dispatching. To determine whether selective dispatching was entered for save area prefixes (SAPs), search the DISPATCH AREA section for the following message:

```
*** NOTE: THIS TCB IS IN SELECTIVE DISPATCHING FOR SAPS
```

If you find this message, IMS wrote an X'450F' log record to the OLDS. This log record contains information about dynamic SAPs, such as the highest number of dynamic SAPs used and the number of times IMS was in selective dispatch for dynamic SAPs.

Examine this X'450F' log record to help determine what might have led to the shortage of dynamic SAPs. Then go to the “Determine the type of WAIT or LOOP that is in progress” on page 41. While performing SAP analysis, keep in mind that the dynamic SAPs are labeled DYNAMIC SAP, and that the CURRENT TCB= indicates the associated task control block (TCB).

If IMS is not in selective dispatching mode, continue with the next step.

3. Can the operator communicate with IMS through the z/OS system console by using the IMS outstanding reply to enter an IMS command, such as /DISPLAY?

- If no, or if you are not sure, go to step 5 now.
- If yes, the problem might be caused by:
  - A data communication failure.
  - The inability of a task to acquire a resource.
  - Non-completion of an event, such as I/O.

Continue with the next step.

4. Can the IMS master terminal operator (MTO) communicate with IMS by issuing various IMS commands, such as /DISPLAY?

- If yes, go to “Determine the type of WAIT or LOOP that is in progress” on page 41.
- If no, the problem might be data communication related. If IMS is still running, issue the following commands:
  - Issue the IMS /DIS NODE *nodename* command. Save the IMS console output.
  - Turn on the IMS node trace with the /TRA SET ON NODE *nodename* command.  
Data is captured in the IMS X'6701' log record. Save the IMS OLDS for execution with IMS utility programs DFSERA10 and DFSERA30.
  - Consider turning the VTAM buffer trace and VTAM internal trace on to complement the IMS node trace, as follows:

```
F NET,TRACE,TYPE=BUF,ID=nodename  
F NET,TRACE,TYPE=VTAM,MODE=EXT,OPT=(API,PIU,MSG)
```

GTF must be active for this option.

- Obtain a memory dump of the IMS and VTAM regions using this series of commands:

```
DUMP COMM=(dump title)  
R id JOBNAME=(j1,j2,j3,j4,j5,j6,j7),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

The variables have the following meanings:

- j1** IMS CTL region job name.
- j2** VTAM region job name.
- j3** IMS DL/I region job name.



**j4** Suspicious IMS dependent region job name, if any.

**j5** Suspicious CCTL (CICS) region name, if any.

**j6** DBRC region job name.

**j7** IRLM region job name (if IRLM database locking was used).

The jobs are listed in order of importance.

**Recommendations:** A memory dump of the IMS CTL, VTAM, DL/I, and suspicious dependent region or CCTL is usually sufficient to solve wait/hang problems. Occasionally, the DBRC and IRLM (if they are used for database locking) can be a factor. Obtain a memory dump of DBRC and IRLM as well to ensure that the problem can be resolved quickly.

SYS1.DUMP data sets are often not large enough to hold all regions requested in the DUMP command. Make them large enough to hold the regions. If the z/OS SVC DUMP command fails due to lack of space, take separate memory dumps in smaller combinations to accommodate the smaller SYS1.DUMP data set size.

- Go to the [“Determine the type of WAIT or LOOP that is in progress”](#) on page 41.

5. Query the IMS Dispatch Work Areas.

- Find the Dispatch Work Areas in the formatted dump. The Dispatch Work Areas are created using the DISPATCH or ALL IMS dump formatting options. The Dispatch Work Area eye catcher is \*\*DSP.
- Scan each Dispatch Work Area (STM, CTL, restart data set, and so on) except for the DRC and dependent region entries (labeled DEP, MPP, BMP, DBT, DRA, or IFP). Examine the QPOST field at offset X'1C'.

If the high-order bit of the QPOST field is off, note the address and type of Dispatch Work Area.

- If, after scanning all Dispatch Work Areas, except for the DBRC (DRC) task and dependent regions, you find that the QPOST high-order bit is always set, one of the following situations has occurred:
  - IMS is in an IMS WAIT (IWAIT) state. Go to [“Determine the type of WAIT or LOOP that is in progress”](#) on page 41 now.
  - If at least one Dispatch Work Area has an incorrect high-order bit, a LOOP or operating system WAIT has occurred. Continue with the next step.

6. Query the TCB/RB chain.

- Find the current ECB, address space ID (ASID), and TCB address for each Dispatch Work Area noted previously in step 5b.
  - In IDSPWRK SECTION 1, find field CECB at offset X'28'. The field CECB at offset X'28' contains the ECB of the current dispatched ECB.
  - In IDSPWRK SECTION 1, find the field ASIDS at offset X'30'. The first halfword of the field ASIDS at offset X'30' contains the ASID number for the task; the second halfword contains the CTL region ASID.
  - In IDSPWRK SECTION 1, find the field TCB at offset X'40'. The field TCB at offset X'40' contains the TCB address for the task.
- Find the formatted TCB/RB chain in the z/OS formatted dump. Use the IPCS SUMMARY FORMAT ASID(X'\_\_') command for the ASID/TCB found in step 6a. Use the following FIND command to locate the TCB:

```
F 'TCB: xxxxxxxx' 1 16
```

where xxxxxxxx is the 8-character TCB address, including leading zeros.

- c. Examine the request block (RB) structure (PRBs, SVRBs, or IRBs), focusing on the last RB in the chain for that TCB. The TCBRBP field at offset X'00' contains the address of the last RB. Use the following FIND command to locate the RB:

```
F 'RB: xxxxxxxx' 1 16
```

where xxxxxxxx is the 8-character RB address, including leading zeros.

Exception: Using the last RB in the TCBs RB chain is usually accurate. However, there are occasions when additional RBs might be appended to the end of the chain to facilitate dump processing, but they have nothing to do with the problem. X'00020033' in the WLIC field in any RB in the RB chain normally indicates dump processing. In such a case, examine the RBs prior to the RB with WLIC=X'000020033'. If the RB before the RB containing WLIC=X'00020033' contains WLIC=X'0002000C, it might be necessary to examine the RB before the RB containing WLIC=X'00002000C'.

Example:

```
PRB WLIC = X'00020006'
PRB WLIC = X'00020078'
SVRB WLIC = X'0002000C'   Examine prior RB.
SVRB WLIC = X'00020033'   <== Indicates dump processing
SVRB WLIC = X'00020078'
```

- d. Examine the LINK field in the RB found in step 6c. The high-order byte of the LINK field is the wait count field.
- If the wait count is X'00', the task is probably looping. Perform the following steps:
    - Perform system loop diagnostics. Obtain the OPSW and registers from the looping RB, (located in the following RB or in the TCB, if this is the last RB (TCBRBP)) for a snapshot of the loop.
    - Obtain the PSW address from the z/OS system trace table. Use the IPCS VERBX TRACE ASID(*xxx*) command to obtain the entries for the ASID in question. Focus on the entries for the TCB found in step 6a. You can ignore entries between any SVC and associated SVCR because they reflect necessary z/OS operating system activity indirectly involved in the loop. (The IMS TYPE2 SVC is an exception to this since it results in execution of IMS code.) Sorting the pertinent addresses by OPSW address greatly aids in laying out the loop.
    - Resolve the PSW address found by using either IPCS BROWSE mode, the IPCS WHERE command, or by using an LPA or NUCLEUS MAP to obtain the name of the modules involved in the loop. The IPCS commands used to obtain the maps are LPAMAP, and VERBX NUCMAP. Calculate the offset at which the instruction appears in the modules to outline the path of the loop.
    - Another source of information for the looping task can sometimes be found at the top of the IMS SAPS AND SAVEAREA section (\*\*SSA) of the IMS formatted dump. Look for the \*\*\*\* A C T I V E \*\*\*\* save area set nearest the top of the \*\*SSA with the SAPECB filed matching the CECB field obtained in step 6a. The save area flow can indicate IMS modules involved in the loop or those passing control to the looping function.
  - If the wait count is not X'00' (that is, = X'01', or X'02', and so on), a system WAIT has probably occurred. Perform the following steps:
    - Obtain the address portion of the OPSW. It points to the waiting module.
    - Resolve the PSW address found by using either IPCS BROWSE mode, the IPCS WHERE command, or by using an LPA or NUCLEUS MAP to obtain the name of the waiting module. The IPCS commands used to obtain the maps are LPAMAP, and VERBX NUCMAP, respectively. Calculate the offset at which the wait occurred in the module. This information can be used for APAR searches and to assist IBM Software Support representatives.
    - Use the CECB field obtained in step 6a to find the related SAP save area by scanning for the SAPECB match in the IMS formatted memory dump \*\*SSA section.

## SAP analysis procedure

1. Find the formatted SAP AND SAVE AREA section in the IMS formatted dump.

Choose either the SAVEAREA, SYSTEM, ALL or SAVEAREA,SUM options of the IMS Offline Dump Formatter. The eye catcher of the SAP AND SAVE AREA section is \*\*SSA.

The following table defines the key fields in SAP analysis.

*Table 3. Key fields in SAP analysis*

Offset	Field name	Length	Field description
SAP+X'00'	SAPFLAG1	1	X'80' = Active SAP X'40' = Waiting SAP
SAP+X'01'	SAPDSPCD	1	IMS TCB number. This number matches the associated TCB number at offset X'3B' in the dispatch work area.
SAP+X'14'	SAPIWAIT	4	In waiting SAPs, this is the address of the last active save area. Those below this address are residual. In SAPs that are active but not waiting, this field is residual and should not be used.  Exception: SAPIWAIT might not be valid for Fast Path save area sets (DBF-prefixed modules). The active save area set usually ends with DBFXSL30, the Fast Path wait module, unless DFSIWAIT or DFSISERW appears previously in a save area set.
SAP+X'18'	SAPECB	4	Address of the ECB associated with this ITASK. If the PST is used, this field points to the beginning of the PST.
SAP+X'24'	SAPCDSP	4	Address of the current dispatch work area.
SAP+X'30'	SAPSDPNO	4	Dispatch number for the ITASK.

2. Begin SAP analysis at the end of the sorted SAPs.

Find the end of the sorted SAPs. Eye catcher \*\*\*END OF SORTED SAP FORMATTING marks the end of the list. SAPs are sorted by the SAPSDPNO (system dispatch number). The most recently dispatched ITASKs are at the end of the sorted SAPs. These are the ITASKS that have been waiting the longest and possibly causing the other ITASKS to wait behind them by holding a resource, such as a lock or a latch.

3. Scan backwards from the end, examining only active or waiting SAPs. Focus only on the active save area sets (that is, SAPFLAG1 has the X'00' bit turned on (X'08', X'Cx', X'Dx', X'Fx')). Active save area sets are marked with the eye catcher \*\*\*\* W A I T I N G \*\*\*\* or \*\*\*\* A C T I V E \*\*\*\*. To find waiting or active SAPs, use the following find command:

```
F ' **** ' PREV
```

The SAVEAREA,SUM option of the Offline Dump Formatter produces only active save area sets. Active running SAPs are marked with the eye catcher RUN. The end of this formatting is marked by the eye catcher \*\*\*\*\* END SAP SUMMARY.

4. Skip all normal save area sets.

This step describes all normal save area sets. After you have identified all types of normal save area sets, you can disregard them because they are unrelated to the problem.

- a. WAITING save area sets in which module name DFSIWAIT appears after label EP at the second-level save area are considered normal save area sets.

The following example shows a normal save area set at the second level:

```
***SAVE AREA SET***
EP DFSQMRTO-11/13/94
SA 00133BC4          WD1 8091E430   HSA 80000000   LSA 00133C0C ...

EP DFSIWAIT
SA 00133C0C          WD1 00000000   HSA 00133BC4   LSA 00133C54 ...

EP DFSFLLG0-220-PL46803
SA 00133C54          WD1 00000000   HSA 00133C0C   LSA 00133C9C ...
.....
```

- b. The only normal save area sets in which the save area set contains DFSIWAIT at the third level are shown in the following example. Ensure that register 08 contains a value of X'00000003' for any of the first four save area sets, as shown in the example. Otherwise, it is abnormal and indicates an intent conflict, as described in [“Intent conflict” on page 53](#). Use the SAPSECB field to obtain the PST address for use in the intent conflict procedure.

```
EP DFSSMIC0 --> EP SMSC2      --> EP DFSIWAIT with REG08 = x'00000003'
EP DFSSMIC0 --> EP DFSSMSC2 --> EP DFSIWAIT with
REG08 = x'00000003'
EP DFSSMIC0 --> EP DFSSMSC1 --> EP DFSIWAIT with
REG08 = x'00000003'
EP DFSSMIC0 --> EP MPPENQ00 --> EP DFSIWAIT with REG08 = x'00000003'

EP DFSFXC30 --> EP DFSFXC30-WFITEST --> EP DFSIWAIT
EP DFSVTP00 --> EP VTPOWORK --> EP DFSIWAIT
EP DBFHCL00 --> EP DBFHGU10 --> DBFXSL30
```

- c. The only normal save area sets in which the save area contains DFSIWAIT at the fourth level are those shown in the following example. Ensure that register 08 in the DFSIWAIT save area set contains X'00000003'. Otherwise, it is abnormal and indicates an intent conflict, as described in [“Intent conflict” on page 53](#). Use the SAPSECB field to obtain the PST address for use in the intent conflict procedure.

The following examples show normal save area sets at the fourth level:

```
DFSSMIC0 --> DFSSMSC0 --> SMSC1000 --> DFSIWAIT  REG08 = x'00000003'
DFSFXC30 --> DFSDLA30 --> DLA32000 --> DFSIWAIT
```

- d. The following active save area sets are probably normal, so you can ignore them.
- Save area sets marked ACTIVE or RUN with SAPDSPCD=X'07'. This is a DRC task SAP. This condition is usually normal for the DBRC task.
  - Save area sets marked ACTIVE or RUN with SAPDSPCD=X'0F'. This is the ESI task SAP if SAPCDSP=X'00000000'.
  - Dependent region save area sets marked ACTIVE with SAPDSPCD=X'03'(MPP), X'04'(BMP), X'0D'(DRA), X'12'(IFP), X'13'(DBT), X'0C'(ESS), or X'00'(RESIDUAL), in which the top save area indicates it was returned. (The last bit of the address in the field labeled RET, which is register 14, is odd or has X'FF' in the high-order byte.)
  - If the SAPDSPCD=X'13'(DBT), and the first save area EPA is marked UNKNOWN with the second-level save area RET field marked returned (the last bit of the address in RET is odd), this is a normal save area set if the first save area EPA is within module DFSDASCO or DFSDAST0.
5. Obtain abnormal save area set information.

The remaining save area sets (those that are ACTIVE or WAITING, but abnormal, as described in step 4 are involved in the wait in some way.

**Recommendation:** Concentrate on one save area set at a time, beginning with the first abnormal save area set. Remember to start from the end of the sorted SAPs.

If you find an abnormal save area set marked \*\*\*\*\* A C T I V E \*\*\*\*\* (SAPFLAG1=X'80'), the problem is associated with the TCB/RB save area set. Use the address of the current dispatch area in SAPCDSP to find the dispatch work area associated with this save area set. Go to step 6a in the WAIT/ LOOP procedure. Continue from there, using the ASID/TCB obtained from the dispatch work area. If the high-order bit in QPOST is on (QPOST=X'8x'), this SAP is suspended. Record this save area set and continue to the next abnormal save area set. Discontinue step 6a because this save area set should probably be ignored. Otherwise, continue.

Record the following key fields from the abnormal save area sets flagged as:

\*\*\*\*\* W A I T I N G \*\*\*\*\*

- a. The address of the SAP.
- b. For each save area in the save area set, from the first save area down to the save area pointed to by the SAPIWAIT field, obtain the following information. (See exception for SAPIWAIT in [Table 3 on page 45](#) before proceeding.)
  - 1) EP module name
  - 2) APAR level (the APAR number and last few letters of the changeID string)
  - 3) RET address (this is register 14)
  - 4) EPA address

If the module name is UNKNOWN and the module save area set begins with DFSDLA00, the EPA address can probably be resolved in the DL/I region dump by using IPCS BROWSE mode for the DL/I ASID.

- c. The offset from which DFSIWAIT, DFSISERW, or DBFXSL was invoked from the calling module.

You can calculate the offset by subtracting the EPA address in the save area **before** the save area pointed to by SAPIWAIT from the RET address of the save area pointed to by SAPIWAIT.

The following table shows key data from an abnormal save area set.

*Table 4. Key data from an abnormal save area set*

EP module name	APAR number	Last few ChangeIDs	RET	EPA	Wait call offset
DFSCST00	PL45938	abcde	80A7BA14	00A8E110	
DFSDBDRO	PL49770	..mnopr	60A8E6D6	00A07A58	
DFSBML00	none		50A07AC2	00B5DAE0	X'10E'
DFSIWAIT	none		40B5DBEE	70A7C7F6	

6. Identify the reason for the WAIT.

To identify the reason for the WAIT, do the following:

- a. Assemble the module that issued the wait. Use the offset obtained in step 5 as an approximate displacement into the module where an IWAIT or ISERWAIT was issued. Examine the code and comments at that point. Most modules give the reason for the IWAIT in the comments above the IWAIT issue point.

The EP name might not be the actual module name, but rather a CSECT within a module. To find the actual module name, using IPCS BROWSE mode, scan backwards from the EPA address for the actual module name.

7. Repeat steps 5 and 6 for the first three abnormal save area sets you found.

You should be able to gather enough information from the first three abnormal save area sets to perform a search or determine the cause of the problem.

## Keyword: WAIT

At this point, you can be sure that you are in an IMS WAIT. Therefore, WAIT is an appropriate keyword for the search argument.

## Keyword: module name issuing IWAIT or ISERWAIT

The Module Name column in your worksheet indicates the modules that issued the IWAITs. These modules can provide useful search arguments. Use the 8-character module name for this keyword.

## Keyword: WAIT reason

The IWAIT REASON column in your worksheet indicates the reason or resource, or both, that is causing the IMS WAIT.

For example, if the reason was a WAIT for the DPST latch, the IWAIT REASON keyword is DPST LATCH.

## Keyword: additional related keywords

External events might trigger WAITs. These events might be indicated by console messages, or they might be related to a procedure that was being performed at the time the WAIT began.

You can use each of these additional keywords in the search argument when applicable.

## Search argument example

Consider this scenario:

- IMS went into a IWAIT after a WADS write error occurred.
- Multiple unusual save area sets were found from module DFSFLLG0.
- The reason for the IWAIT was found to be the LOG LATCH.

The broad search argument to use is:

```
5655J3800 WAIT LOG | LATCH | W ADS | DFSFLLG0
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 WAIT PCSS/LOG | PCSS/LATCH | PCSS/WADS | RIDS/DFSFLLG0
```

With this search argument, you might receive numerous search results, which will probably contain the APAR describing your problem. You can then take various combinations of the additional keywords that were compared with the **OR** operator in the above example and use the **AND** operator on the keywords instead. You can use this technique to narrow your field of search until you find the appropriate APAR.

## PST analysis

This section deals with analyzing regions for possible problems in scheduling, intent conflicts, and so forth.

1. Determine the number of active regions.

SCDREGCT at SCD+X'C8A' is a 2-byte field that contains the number of active regions, if any.

If SCDREGCT = X'0000', no regions are active. Go back to [“Determine the type of WAIT or LOOP that is in progress” on page 41](#).

If SCDREGCT is not equal to X'0000', go to step 2.

2. Determine if the scheduler sequence queues (SSQs) have any entries.

Obtain the address of the transaction anchor block (TAB) from the SCDTAB field in the DSECT (label TABEP in the formatted dump). The TAB, which is mapped by DSECT DFSTAB, consists of:

- TAB header
- Headers for each of the six subqueues (SSQ1 - SSQ6)
- Class vector table (CVT)
- Transaction class tables (TCTs)

If the count of partition specification tables (PSTs) waiting on any subqueue (field TABSCHQC) equals 0, no region should be waiting on any subqueue. However, you should also check each subqueue header. Calculate the address of the subqueue header for a specific subqueue (SSQ#) as follows:

- SSQ# × X'18' - X'8' = offset of header for SSQ#
- Offset of header for SSQ# + SCDTAB address = address of header for SSQ#

Perform this calculation for each subqueue number. If field TABSSQnF, where n is the subqueue number, is not zero, this field contains the address of an entry on the SSQ for the specified subqueue.

- The SSQ consists of the following six subqueues. All subqueues are formatted in a dump.

**Subqueue 1**

Reserved for future use.

**Subqueue 2**

JMP region waiting for work.

**Subqueue 3**

MPP region waiting for work.

**Subqueue 4**

MPP/JMP region waiting for intent.

**Subqueue 5**

BMP/JBP region waiting for intent.

**Subqueue 6**

MPP/BMP/JMP region waiting for input.

- Each subqueue represents a resource. A PST enqueued on a subqueue is waiting for that resource.
- The TAB and SSQs are formatted after the SCD LATCH EXTENSION in an IMS formatted dump, as follows:

```

**TAB - TRANSACTION ANCHOR BLOCK**
0D1873B0 00000000 005800FF 00000000 * .....*
0D1873C0 0000000E 00000000 00000000 * .....*
0D1873D0 00000000 00000000 00000000 * .....*
      LINES 0D1873E0-0D1873EF SAME AS THE ABOVE
0D1873F0 00000000 00000000 0CF18544 0CF00C40 * .....1...0.*
0D187400 00000000 00000000 00003614 00000000 * .....*
0D187410 0CF18C40 0CF18C40 00000000 00000000 * .1. .1. ....*
0D187420 00003AEB 00000000 00000000 00000000 * .....*
0D187430 00000000 00000000 0000396E 00000000 * .....*
0D187440 00000000 00000000 00000000 00000000 * .....*
0D187450 000010B4 00000000 0D187858 0D1878B0 * .....*
0D187460 0D187908 0D187960 0D1879B8 0D187A10 * .....*
0D187470 0D187A68 0D187AC0 0D187B18 0D187B70 * .....*
.....
.....
.....
.....

***SCHEDULER SEQUENCE QUEUES***

DFSPSTQE 00000000 SUBQ 1 NOT ACTIVE
SUBQ 2 NOT ACTIVE
SUBQ 3 NOT ACTIVE
SUBQ 4 NOT ACTIVE
SUBQ 5 NOT ACTIVE
SUBQ 6 NOT ACTIVE

```

- If the words NOT ACTIVE follow the subqueue entry, no PSTs are enqueued on that entry.
- If entries are listed for subqueue 3, go to [“No work to do” on page 51.](#)
- If no entries are listed for subqueue 3, go to step 3.

3. Are there subqueue 4 or 5 entries?

Subqueue 4 does not apply to a DBCTL environment.

Entries on subqueue 4 or 5 are waiting for intent conflicts to be resolved.

- a. If entries are listed for subqueue 4 or 5, go to [“Intent conflict” on page 53](#).
- b. If not, go to step 4.

4. Are there subqueue 6 entries?

This step does not apply to a DBCTL environment. Continue with the next step.

Entries on subqueue 6 are waiting for input.

- a. If there are entries listed for subqueue 6, go to [“WAIT for input” on page 53](#).
- b. If there are no entries, go to step 5.

5. Are all regions accounted for?

Compare the number of regions in the SCDREGCT (SCD+X'C92') with the number of regions enqueued on the subqueues. (The SCDREGCT is 2 bytes.)

- a. If the numbers of regions are equal, go to step 6.
- b. If the numbers of regions are not equal, all regions are unaccounted for. Go to the analysis for [“PST analysis” on page 48](#).

6. Report the problem.

This problem occurs when there are entries queued on the subqueues and no reason can be found to prevent their scheduling, but nothing schedules. Report the problem to the IBM Support Center.

### **PST active**

You reach this point in the analysis either when:

- The SCDREGCT field is not equal to zero, and there are no entries on the Scheduler Sequence Queues, or
- No problem was found in analyzing the PSTs on the subqueues, and the number of PSTs on the subqueues is less than that in the SCDREGCT field.

1. Locate the PSTs.

Find the stack of dependent region PSTs in the dump. (Two stacks of PSTs exist in the dump. System PSTs are printed separately from the dependent region PSTs.)

2. Is the PST scheduled?

- a. Find all the PSTs with PSTTERM (X'1BC') = X'02' (ACTIVE) and PSTCODE1 (X'B7A') = X'10' (SCHEDULED).
- b. Ignore the PSTs without the SCHEDULED bit on.

3. For the scheduled PSTs, do SAP analysis.

- a. PST at offset minus X'04' (field name PTR) is usually the SAP address. (The PTR field is the last entry on the line above the X'0000' line in the dump.) If not, PST + X'5B8' (PSTSAV1) is the address of the first Save Area in a set, and WD1 in that Save Area is the address of the SAP.
- b. Go to [“Determine the type of WAIT or LOOP that is in progress” on page 41](#). Return here after doing SAP analysis for the scheduled PSTs only.

4. Are there any ACTIVE non WAITING SAPs?

- a. If any of the SAPs are marked ACTIVE go to step 5.
- b. If SAPs are found WAITING, use normal SAP analysis to report the problem. Use the search argument format [“Search argument example” on page 48](#).

5. Is the dependent region active within an IMS save area set?



- a. If SAP +X'08' (SAPCNTRL) = X'10', this region is in a DL/I call within IMS. Go to step 6.
  - b. Otherwise go to step 7.
6. Analyze the region dump.
- You must analyze the region dump using the PSW address to identify the problem. Refer to [“WAIT/LOOP procedure” on page 41](#), steps 6c and 6d.
7. Determine what the application program is doing.
- You must analyze the region dump using the PSW address to identify what the application program is doing.
- In a DBCTL environment, you must analyze the CCTL region dump using the PSW address to find out what the DRA, CCTL, or application program is doing. Refer to [“WAIT/LOOP procedure” on page 41](#), steps 6c and 6d.
8. Determine the reason the latch is not freed.
- If a latch is being waited for, and the owner is not waiting for I/O, use SAP analysis to identify the reason for the WAIT.

### No work to do

This section does not apply to a DBCTL environment.

You came to this point because subqueue 3 contains PSTs.

1. Locate the PSTs on subqueue 3.

The addresses under the field name SQPSTADD are the PST addresses. In the formatted dump, the PSTs start with the eye catcher \*\*\* DB PST AREA \*\*\*. Locate the PSTs that are on subqueue 3.

2. Find the classes the PSTs can execute.

PST + X'C68' (PSTCLASS) is an 8-byte field. Each byte indicates a class transaction that the PST is allowed to process. For example, if PSTCLASS = 00010003 00050006, the PST can process classes 0001, 0003, 0005, and 0006.

3. For each PST on subqueue 3, locate the transaction class table (TCT) for each class that the PST can process. There is one TCT for each class.
  - a. Obtain the TAB address from the SCDTAB. SCD+B88 points to SCDTAB and is labeled TABEP in IMS Dump Formatter.
  - b. Take the first PSTCLASS value and subtract 1.
  - c. Multiply this result by 4.
  - d. Add this value to the TABCLASS offset value + X'A0'.
  - e.  $TCT = 4 \times (\text{first PSTCLASS value} - 1) + X'A0'$ .

When the high-order byte contains a X'80' this indicates the TCT class is not active.

4. Can any SMBs be scheduled?

TCT +X'04' = zero or the address of an SMB that can be scheduled.

- a. If zero, no SMBs can be scheduled. Go to step 7.
- b. If SMBs can be scheduled, locate the SMBs and then go to step 5.

5. Is SMB locked or stopped?

- a. If SMB +X'24' (SMBSTATS) = X'10' (STOPPED) or X'08' (LOCKED), go to step 6.
- b. Otherwise, go to step 9.

6. Are there any more SMBs on this class?

- a. If SMB+X'04' (SMBQEFP) is not equal to zero, it is the address of the next SMB. Move on to the next SMB and repeat step 5.

- b. If `SMB+X'04'` (`SMBQEF`) = zero, there are no more SMBs. Go to step 7.
7. Are all classes accounted for?
- If all classes found in `PST + X'C68'` (`PSTCLASS`) are not accounted for, repeat step 4 for each remaining class.
  - Otherwise, go to step 8.
8. Are all regions accounted for?
- To determine whether all regions are accounted for, use `SCDREGCT` (`SCD + X'C8A'`). The `SCDREGCT` is 2 bytes. There is one `PST` for each region.
- If the number of `PST`s on subqueue 3 is equal to the `SCDREGCT` and they have been examined and accounted for, there are no transactions scheduled for the regions. This is a normal `WAIT`, and there is no work for `IMS` to perform. This is not a problem.
  - Otherwise, go back to 3 to continue the scheduler queue analysis.
9. Locate the `PSB` directory (`PDIR`).
- If the `SMB` is not locked or stopped, locate the `PDIR`: `SMB+X'3C'` (`SMBPDIR`) = address of the `PDIR`.
10. Can `PDIR` schedule?
- Locate the `PDIR` entry. When any of the following bits are `ON`, the `PDIR` is unable to schedule.
- `PDIR + X'20'` (`PDIRCODE`) =**  
`X'40'X'10'X'08'X'02'`
- If the `PDIR` cannot schedule, go back to step 6.
  - Otherwise, go to step 11.
11. Is `PDIR` marked parallel?
- If the `PDIR` is marked scheduled but not parallel:
- ```
PDIR+X'20' (PDIRCODE) = X'04' (Scheduled)
and:
PDIR+X'21' (PDIROPTC) is not equal to X'04' (Not parallel)
```
- If there are entries listed for subqueue 6, go to “`WAIT` for input” on page 53 to determine if any of the waiters on subqueue 6 are pseudo `WFIs` scheduled against the same `PDIR`. If there is a pseudo `WFI` scheduled against the same `PDIR`, report the problem to the `IBM Support Center`.
- If there are no entries listed for subqueue 6 or none of the waiters on subqueue 6 point to the same `PDIR`, go back to step 6.
- If marked parallel (`PDIR + X'21' = X'04'`), go to step 12.
12. Are enough messages enqueued for another `PST`?
- If the `PDIR` is marked parallel, check if enough messages are enqueued on the `SMB` to schedule another `PST`.
- You do this by finding:
    - `SMB+X'46'` (`SMBPARLM`) = number of messages per region (2 bytes).
    - `SMB+X'44'` (`SMBRGNS`) = number of message regions scheduled for the `SMB` (2 bytes).
    - `SMB+X'1A'` (`SMBENQCT`) minus `SMB + X'18'` (`SMBDEQCT`) = number of messages currently enqueued. (To find the number currently enqueued, subtract the messages dequeued from those enqueued.)
  - If the number of messages currently enqueued (step 12a3) is greater than the number of messages per region (step 12a1) multiplied by the number of message regions scheduled (step 12a2), there are enough messages enqueued on the `SMB` to schedule another `PST`. Go back to step 6.
  - Otherwise, go to step 13.
13. Report the problem.

At this point, regions are waiting, enqueued on subqueue 3 with transactions that can be scheduled. Report the problem to the IBM Support Center.

### **Intent conflict**

You reach this point by having entries on subqueue 4 or 5.

An intent problem is indicated when the PST is on the intent queue.

1. Locate the PSTs that are on subqueue 4 or subqueue 5, or both.

The addresses under the field name SQPSTADD are the PST addresses. To analyze the INTENT CONFLICT fields in a PST, you must locate the PST in the unformatted section of the dump.

2. Is the PSB work pool too small?

- a. If PST + X'B7A' (PSTCODE1) = X'06', the PST is on the PSB WAIT queue for pool space. The PSB work pool is too small. You must increase the size of the PSBW parameter in the DFSPBxxx member.

- b. Otherwise, go to step 3.

3. Is the Data Management Block (DMB) pool too small?

- a. If PST + X'B7A' (PSTCODE1) = X'20', the DMB pool is too small. You must increase the size of the DMB parameter in the DFSPBxxx member.

- b. Otherwise, go to step 4.

4. Can intent be satisfied?

- a. If PST + X'B7A' (PSTCODE1) = X'40', the intent cannot be satisfied. Go to step 6.

- b. Otherwise, go to step 5.

5. Is the region scheduled?

- a. If any PST has the following:

- PST +X'B7A' (PSTCODE1) = X'10'(SCHEDULED)
- and:
- PST +X'1BC' (PSTTERM) = X'02'(ACTIVE)

the region is scheduled, and this a normal WAIT for subqueue 4 and subqueue 5. Usually this is not a problem. Go back to the subqueue 6 entry of [“PST analysis”](#) on page 48, step 4 and continue.

- b. Otherwise, go to step 7.

6. There is an intent conflict.

If you reach this point, there is an intent conflict. Usually, the intent conflict is caused by a PSB having the exclusive option. This option is defined during the PSBGEN. See the PSBGEN section of *IMS Version 14 System Utilities*. If the exclusive option did not cause the intent conflict, report the problem to the IBM Support Center.

7. Report the problem.

If you reach this point, the problem is that the last region to terminate should have posted the PST on subqueue 4 and subqueue 5 and did not. In a DBCTL environment, the last thread to unschedule a PSB did not post subqueue 4 or 5. Thus, there is a WAIT with a PST on subqueue 4 or subqueue 5 with no scheduled regions. Use subqueue 4 or subqueue 5 in your search argument, or report the problem to the IBM Support Center.

### **WAIT for input**

You can reach this point only by having entries on subqueue 6.

1. Find the PSTs on subqueue 6.

The addresses under the field name SQPSTADD are the PST addresses. The PSTs are found in the stack of PSTs.

2. Find Scheduler Message Blocks (SMBs) for the PSTs.

For each PST enqueued on subqueue 6, find the related SMB:  $PST + X'C4'$  (PSTSMB) = address of the SMB.

3. Are any of the regions on subqueue 6 pseudo WFIs?

- If  $SMB + X'27'$  (SMBFLAG3) =  $X'08'$  (WFI transaction), the region is not a pseudo WFI.
- If the region is a pseudo WFI, check if the region is holding any resources needed by transactions waiting to be processed.

4. Are any messages enqueued on SMB?

There should be no messages enqueued on the SMB.

- $SMB + X'1A'$  (SMBENQCT) minus  $SMB + X'18'$  (SMBDEQCT) = number of messages enqueued
  - If there are messages enqueued on the SMB, go to step 6.
  - If no messages are enqueued, go to step 5.

5. Are all regions accounted for?

Compare the count of regions enqueued on the subqueues with the count in SCDREGCT ( $SCD + X'C92'$ ) (2 bytes).

- If the counts are equal, all regions are accounted for, and the IMS regions are in a normal scheduling environment. The problem is not with scheduling.
- If not equal, other regions are active in IMS. Go to [“PST active” on page 50](#).

6. Report the problem.

The problem is that IMS messages are enqueued on the SMB and wait-for-input (subqueue 6) is not posted. Report the problem to the IBM Support Center.

## Loop

Use standard z/OS system diagnostic procedures for loops.

Using the RB found in step 6c of [“WAIT/LOOP procedure” on page 41](#), determine the PSW address. The PSW address is labeled OPSW. The PSW address is always the second word following the label. This PSW address belongs to one of the modules involved in the loop.

You can use the z/OS system trace to examine entries for the ASID and TCB indicated in the Dispatch Work Area at step 5 of the [“WAIT/LOOP procedure” on page 41](#). The PSW address in the system trace entries indicates the modules involved in the loop.

Locate the PSW addresses in the storage section of the dump and scan backward through the eye catchers on the right side of the dump until you find a module identifier.

The looping module might not be an IMS module. Sometimes, the addresses are in the Link Pack Area (LPA) or the nucleus and might require an LPA or nucleus map.

## Create the search argument

You can use the following additional keywords in the search argument to narrow the search, but they might not be necessary.

### Keyword: LOOP

At this point, you can be sure that you are in a loop situation. Therefore, LOOP is an appropriate keyword for the search argument.

### **Keyword: module names involved in the loop**

The module names derived in the loop procedure above are also valid keywords.

### **Keyword: label in module**

If it is a tight loop, labels from the assembly listing of the modules involved might be useful keywords.

### **Keyword: additional related keywords**

External events can trigger loops. These events might be indicated by console messages or be related to a procedure that was being performed at the time the LOOP began.

### **Search argument example**

Consider the following scenario:

- IMS went into a loop.
- The active modules indicated in the RB chain and the z/OS system trace table were DFSCFEI0 and DFSCFE00.
- The loop began after the operator issued a /DISPLAY NODE command.

The broad search argument to use is:

```
5655J3800 LOOP DFSCFE00 | DFSCFEI0 | DISPLAY | NODE
```

For a structured database search, use this search argument:

```
PIDS/5655J3800 LOOP RIDS/DFSCFE00 | RIDS/DFSCFEI0 | PCSS/DIS | PCSS/NODE
```

With this search argument you might receive numerous hits, which will probably contain the APAR describing your problem. You can then take various combinations of the additional keywords that were compared with the **OR** operator in the above example and use the **AND** operator on them instead. You can use this technique to narrow the field of search until you find the appropriate APAR.

If the loop was not in an IMS module, do not use the IMS component ID, 5655J3800.

### **System wait**

Use standard z/OS systems diagnostic procedures.

If the PSW address is for a system module, include that information when reporting the problem. You can use the module name in your search along with the WAIT keyword.

### **Shutdown processing**

Use this analysis if the operator issued a /CHECKPOINT FREEZE, DUMPQ, or PURGE to IMS and IMS failed to come down normally. Before taking IMS out of the system, be sure to use a /DISPLAY SHUTDOWN STATUS command. Obtain the listing of the /DISPLAY command and any subsequent activity to find any unusual conditions that might have prevented an orderly termination of IMS.

You should also use this analysis if IMS shut itself down and failed to terminate normally. For example, when IMS runs low on message queue space, it shuts itself down.

Before starting this procedure, you need to obtain an IMS dump in order to examine bit settings. Be aware that if you received only the first part of the DFS994I message during shutdown processing, VTAM might be involved in the failure. (For a DBCTL environment, ignore any further instructions that refer to VTAM in this topic and in the next topic, “Shutdown analysis (CHE FREEZE, DUMPQ, or PURGE)” on page 56.) If you received the DFS994I xxx (FREEZE, DUMPQ, PURGE), but not DFS994I IMS SHUTDOWN COMPLETED, be sure to obtain a dump of VTAM and IMS. Here are two ways to get a dump:

- Enter the z/OS DUMP command to dump the VTAM address space and then modify IMS down with a dump.
- Enter the z/OS DUMP command to dump the VTAM, IMS control, DL/I, and CCTL address spaces, and then modify IMS down without a dump.

Be sure to include the RGN option along with the other standard SDATA defaults in the DUMP command.

In the section "Shutdown Analysis" that follows, note the following:

- Displacements and test conditions can change when maintenance is applied to a system.
- The bit settings shown are cumulative. This means that they usually combine with any bits already set in the byte. Check the bit settings as described. If a bit was not set or reset as shown, include both the module name and the cumulative bit settings in each byte in your search argument.
- SET turns the bit ON. RESET turns the bit OFF. Other bits in the byte might already be ON.
- It is essential in using the following analysis to find out if the indicated bits were SET or RESET and to use only the DUMPQ/FREEZE or PURGE sections where applicable.
- The Save Areas (SAs) might not always identify the last module to have control. In some cases, control is passed back to the initiating module (such as DFSCST00), and you can find no trace of any lower modules in the SAs.
- The main control block in shutdown problem analysis is the system contents directory (SCD). This flow of control lists most of the modules involved. When you find a field that does not have the bits SET or RESET as indicated, stop the analysis and report the problem.
- Be aware that defective code can produce results that appear to contradict this information.
- The following analysis does not list every action that is taking place in IMS shutdown processing, but only activity that causes bit setting to be changed in key SCD fields.
- Comments scattered throughout the analysis are for information only. For example, the statement, "If input or output is pending, return to DFSICIO0 with RC=C to complete", is for information. Do not look at return codes, but examine only the bit settings.

### Shutdown analysis (CHE FREEZE, DUMPQ, or PURGE)

Remember that in this analysis you will be looking at bit settings, not hexadecimal values.

These sections do not apply to DBCTL shutdown:

- PURGE
- DFSICL20
- DFSICLX0
- DFSICIO0
- DFSIPCP0
- DFSCPCP0
  - DFSICL20
    - If PURGE, then set SCDCKCTL(X'C08') = X'34' and then set SCDSTOP1(X'C02') = X'80'
    - If not PURGE, then:
      - If DUMPQ, set SCDCKCTL(X'C08') = X'1C'
      - If FREEZE, set SCDCKCTL(X'C08') = X'14'
        - Reset POLL the lines and then (not applicable to DBCTL)
        - Set SCDSTOP1(X'C02') = X'C0' (for DBCTL, set AWE to TRM1)
  - DFSICLX0
  - DFSICIO0
  - DFSIPCP0

- If SCDCFLG1(X'AC7') = X'08', then
  - Set SCDCQFLG(X'AC8') = X'04' and
  - Set SCDCNXW4(X'ACF') = X'40'
- If input or output is pending, return to DFSICIO0 with RC=C to complete.
- When there is no input or output pending, or when the input or output is finished, then:
  - Set SCDCPCTL(X'AC4') = X'80'
  - Set AWE to TRM1
- DFSCST00
- DFSTRM00

**For PURGE**

- AWE = TRM1, First phase of termination
- If SCDIDCNT +1 (X'BC8') is not equal to X'000000' and SCDCKCTL(X'C08') = X'20' (PURGE):
  - Set SCDSTOP1(X'C02') = X'10'
  - Set SCDSTOP1(X'C02') = X'02'
- If SCDFTFLG(X'290') = X'20' (Fast Path active), DBFTERM0 posts the Fast Path regions for SHUTDOWN
- DFSTRM00

**For DUMPQ or FREEZE**

- If SCDIDCNT+1(X'BC8') is not equal to X'000000' and SCDCKCTL(X'C08') is not equal to X'20' (Not PURGE)
  - Set SCDSTOP1(X'C02') = X'04'
  - Set SCDSTOP1(X'C02') = X'02'
- If SCDFTFLG(X'290') = X'20' (Fast Path Active), DBFTERM0 posts the Fast Path regions for SHUTDOWN

**For DUMPQ, PURGE, or FREEZE**

- If Fast Path was active on return from DBFTERM0, or if Fast Path was not active, and SCDREGCT(X'C8A') is not equal to X'0000' (ACTIVE REGIONS), then post the PSTs waiting in the scheduler.
- If SCDSHFL1(X'3A4') = X'80' (IRLM in system) or SCDIDCNT+1(X'BC8'), or both, is not equal to X'000000' then return to DFSCST00 to wait for regions to end, If DBCTL, notify DRA before returning to DFSCST00.
- When or if SCDIDCNT+1(X'BC8') = X'000000' (REGIONS ENDED), set SCDSTOP1(X'C02') = X'01'.

**For PURGE only**

- If SCDCKCTL(X'C08') = X'20' (PURGE)
- Set SCDSTOP1(X'C02') = X'20'
- IWAIT for all output to go.

**For DUMPQ, PURGE, or FREEZE**

When all output is done for PURGE or FREEZE or DUMPQ, then:

- If SCDFTFLG(X'290') = X'20' (Fast Path active), DBFTERM1 closes the areas.
- If SCDFTFLG(X'290') is not equal to X'20' or when Fast Path areas are closed then:
  - If SCDSMMS1(X'033') = X'02' (DLI SAS), then:
    - Tell the DL/I region to close the databases (DFSSDL40).
    - IWAIT for the databases to close.

- If not DLI/SAS, then let DFSDLOC0 close the databases.
- Then when all databases and areas are closed: Set SCDSTOP1+1(X'C02') = X'04'.
- DFSCPCP0
    - Set return code (RC) = 8 to ask DFSIPCP0 if communication is still going on.
  - DFSIPCP0 (DFSIPCP2)
    - If no output or no messages on Q3, set return code (RC) = 0 to inform DFSCPCP0.
    - If output or messages on Q3, set return code (RC) = 4 to inform DFSCPCP0, which causes DFSCPCP0 to IWAIT.
  - DFSCPCP0
    - If output is pending (RC = 4)
      - Set SCDPCTL(X'AC4') = X'08'
      - Set SCDSTOP1(X'C02') = X'40'
      - IWAIT for DC to finish.
    - If no output or when output finishes
      - Set off SCDPCTL(X'AC4') = X'08' (reset the bit)
      - Set SCDSTOP1+1(X'C02') = X'08'
      - Reset Poll all lines that are candidates for the SHUTDOWN message
      - Set CTBFLAG3(0D) = X'10' (for all terminals that are to receive the shutdown message)
  - DFSICLX0
  - DFSICIO0
  - DFSIPCP0
    - If any CTBFLAG3(0D) = X'10':
      - Set CTBACTL(10) = X'20'
      - Set CTBACTL(10) = X'10'
      - RC = 8 to DFSICIO0 (send SHUTDOWN message)
    - If NO CTBFLAG3(0D) = X'10':
      - Set SCDDFLGS(X'718') = X'80'
      - Set SCDPCTL(X'AC4') = X'20'
      - RC = 4 to DFSICIO0 (quiesce lines)
  - DFSICIO0
    - If RC = 4, idle the lines
    - If RC = 8, send DFS991 - IMS SHUTDOWN message
    - The WRITE interrupt from the SHUTDOWN message results in the following:
      - Set off CTBFLAG5(0F) = X'80' (reset)
      - Set off CTBFLAG3(0D) = X'10' (the)
      - Set off CTBACTL (10) = X'30' (bits)
  - DFSIPCP0
    - When all line activity is stopped
  - DFSCPCP0
  - DFSTRM00
    - If DBCTL set SCDSTOP = SCDSTSNT, then set SCDSTOP1+1(X'C02') = X'01'
  - DFSRCRT0



- DFSRCP00
  - Send "DFS994I \*CHKPT yyddd/hhmmss\*ctype" (first part of DFS994I message)
  - Set AWE = "TRM2"
  - Set off SCDCKCTL(X'C08') = X'04' (reset the bit)
- DFSTRM00
  - Set SCDTRMFL(X'430') = X'40'
- DFSCST00
- DFSTRM00
  - If DLI/SAS SCDSMMS1(X'033') = X'02', pass AWE to DFSSDL40 to begin Normal Termination
  - If not DLI/SAS or when DFSSDL40 returns
  - If SCDRFPIN(X'C32') = X'80' (Fast Path errors):
    - Print error message
    - Set off SCDRFPIN(X'C32') = X'80' (reset the bit)
    - Close queue data sets (not applicable to DBCTL)
    - IWAIT for closing
    - Set off SCDDSTOP1(X'C02') = X'08' (reset the bit)
- DFSTERM0
  - Terminate DASD log
  - Set off SCDRECTL(X'146') = X'80' (reset the bit)
  - Terminate RDS
  - Terminate IMS system type tasks
  - Signoff DBRC
  - Quit IRLM
  - Close VTAM ACB (not applicable to DBCTL)
  - If DLI/SAS, SCDSMMS1(X'033') = X'02' and the ECB at SCDRSETF(X'D1C') is not equal to X'40' (posted) :
    - IWAIT for the DL/I region to end
    - Set AWE = "TRM3"
    - Set SCDTRMFL(X'430') = X'20'
    - Send "DFS994I IMS SHUTDOWN COMPLETED" (second part of DFS994I message)
- DFSTRM00
- DFSCST00

### **IRLM procedure**

WAIT states can be encountered during IRLM processing in four areas:

- [“Deadlock involving non-IRLM resources” on page 59](#)
- [“Deadlock involving only IRLM resources” on page 60](#)
- [“Lock request not granted because holder did not release lock” on page 60](#)
- [“IRLM latch unavailable” on page 60](#)

### **Deadlock involving non-IRLM resources**

### ***Failure Description***

Application programs waiting for non-IRLM resources and holding IRLM resources are waiting for other applications also holding IRLM resources. The IRLM cannot detect deadlocks involving non-IRLM resources.

### ***Detection***

Use the IMS WAIT diagnostic procedures to discover the non-IRLM resources being waited for. Follow the RLB chains representing resources held or requested for each requesting work unit (WHB) to discover the IRLM resources being waited for. If the wait state occurred as a result of an IRLM error, the function/subfunction is IRLM/DEADLK.

An example of a search argument is:

```
569516401 AR101 WAIT IRLM IRLM/DEADLK
```

For a structured database search, use this search argument:

```
PIDS/569516401 LVLS/101 WAIT RIDS/IRLM RIDS/DEADLK
```

## **Deadlock involving only IRLM resources**

### ***Failure Description***

Application programs are deadlocked for IRLM resources. If all the application programs are waiting for IRLM resources (there are no application programs running which could release the locks that the other application programs are waiting for), this is a deadlock. The IRLM should detect this condition and post one of the waiters as unable to obtain the lock because of a deadlock.

### ***Detection***

Follow the RLB chains representing resources held or requested for each requesting work unit (WHB) to discover the IRLM resources being waited for. If the wait state occurred as a result of an IRLM error, the function/subfunction is IRLM/DEADLK.

An example of a search argument is:

```
569516401 AR101 WAIT IRLM IRLM/DEADLK
```

For structured database search, use this search argument:

```
PIDS/569516401 LVLS/101 WAIT RIDS/IRLM RIDS/DEADLK
```

## **Lock request not granted because holder did not release lock**

### ***Failure Description***

An application program requested a lock, but the request was not granted because the holder of the resource did not release it. This does not result in a deadlock. However, if the requester is not timed out, its task and any others waiting after it might enter a wait state.

An example of a search argument is:

```
569516401 AR101 WAIT IRLM
```

For structured database search, use this search argument:

```
PIDS/569516401 LVLS/101 WAIT RIDS/IRLM
```

## **IRLM latch unavailable**

### Failure Description

An error in IRLM processing can result in an IRLM latch being permanently unavailable. If this condition exists, no new IRLM requests can be processed.

If this error occurs, call the IBM Support Center for help in diagnosing the problem. The support representative will tell you what type of documentation to gather.

### Related tasks

“Receive-any buffer analysis” on page 311

While talking with level 1 or level 2 IBM Software Support representatives, you might need to determine if you are out of receive-any (RECANY) buffers. Use either the IMS IPCS panel interface or the manual procedure to help you determine if this is the case. As you proceed through the steps, write down the information you gather.

## IMS keyword dictionary

You can use free-form searches to retrieve the RETAIN records that contain all the search keywords that you specify. The IMS keyword dictionary describes the conventions for free-form search keywords.

The following table describes the IMS keywords.

| Category/keyword             | Examples                                               | RETAIN keyword                                 |
|------------------------------|--------------------------------------------------------|------------------------------------------------|
| Abends                       | System 0C4<br>User 0845                                | ABEND0C4<br>ABENDU0845                         |
| Access methods               | OSAM<br>VSAM                                           | OSAM<br>VSAM                                   |
| Automatic Operator Interface |                                                        | AOI                                            |
| APARs                        |                                                        | PL12345                                        |
| Checkpoint processing        | Checkpoint<br>Extended Checkpoint                      | CHKPT<br>XCHKPT                                |
| CICS interface               |                                                        | CICS                                           |
| IMS commands (sample list)   | /ASSIGN<br>/CHECKPOINT<br>/ERESTART<br>/TRACE<br>/STOP | CMDASS<br>CMDCHE<br>CMDERE<br>CMDTRA<br>CMDSTO |
| DBRC commands                | INIT.RECON<br>CHANGE.PRILOG                            | INITRECON<br>CHANGEPRILOG                      |
| Condition code               |                                                        | X'CC08' (hexadecimal)                          |
| Control blocks               | Data Control Block<br>Database Descriptor              | DCB<br>DBD                                     |
| Database organization        |                                                        | HDAM                                           |
| Database pre-open            |                                                        | PRE-OPEN                                       |
| Data-sharing environment     |                                                        | DATA SHARING                                   |
| Devices                      | 3270<br>LU TYPE1                                       | D/T3270<br>SLU1                                |
| DL/I address space           |                                                        | DLISAS                                         |
| DSECTs                       |                                                        | IDSPWRK                                        |
| Emergency restart processing |                                                        | ERE                                            |

Table 5. IMS keyword dictionary (continued)

| Category/keyword         | Examples                                                                                               | RETAIN keyword                             |
|--------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Error codes (DBRC)       |                                                                                                        | EC0182062                                  |
| Extended restart         |                                                                                                        | XRST                                       |
| Fast Path                | Fast path area<br>Second CI<br>Main storage database<br>Sequential dependent                           | FASTPATH<br>FPAREA<br>DMAC<br>MSDB<br>SDEP |
| Feedback code            |                                                                                                        | FDBK0C (HEX)                               |
| Fields                   | PSTUSID                                                                                                | PSTUSID                                    |
| Function sub-function    |                                                                                                        | SYS CHKRT                                  |
| Function codes           |                                                                                                        | FC0291                                     |
| System definition        | ACB<br>NUCLEUS                                                                                         | ACBGEN<br>NUC                              |
| IRLM                     |                                                                                                        | IRLM                                       |
| Labels                   | LOOPNEXT<br>FREEMAIN                                                                                   | LOOPNEXT<br>FREEMAIN                       |
| Log records              | TYPE 18<br>TYPE 67FF                                                                                   | TYPE18<br>TYPE67FF                         |
| Macros                   | RWOS<br>TERMINAL                                                                                       | RWOS<br>TERMINAL                           |
| Master Terminal Operator |                                                                                                        | MTO                                        |
| Messages                 | DFS045I<br>IEC030I                                                                                     | MSGDFS045I<br>MSGIEC030I                   |
| Modules                  | DFSPCC20                                                                                               | DFSPCC20                                   |
| Online change            |                                                                                                        | OLC                                        |
| Online data set          |                                                                                                        | OLDS                                       |
| Online image copy        |                                                                                                        | OLIC                                       |
| Parameters               | ERROPT=ACCEPT                                                                                          | ERROPT=ACCEPT                              |
| Processing options       | PROCOPT=GO                                                                                             | PROCOPT=GO                                 |
| Publication numbers      | GC18-9717                                                                                              | GC189717                                   |
| Reason codes             |                                                                                                        | RSN08 (HEX)                                |
|                          | Use RSN as the prefix and use the hexadecimal reason code of any length. Do not include leading zeros. |                                            |
| Registers                | General purpose registers<br>Control registers<br>Floating point registers                             | REG13 (DECIMAL)<br>CREG10<br>FPREG01       |
| Restart processing       |                                                                                                        | RSTRT                                      |
| Return codes:            | Return code 12 (X'0C')                                                                                 | RCOC                                       |
|                          | Minimum of 2 digits. If there are more than 2 digits, do not include leading zeros.                    |                                            |
| RSR environment          | RSR                                                                                                    | IMSRSR                                     |
| Sense codes              | Sense 080B                                                                                             | SNS080B                                    |

Table 5. IMS keyword dictionary (continued)

| Category/keyword          | Examples                             | RETAIN keyword                   |
|---------------------------|--------------------------------------|----------------------------------|
| Status codes              | Status code GE<br>Status blank BLANK | STATUSGE<br>STATUS4040           |
| Sub-code                  |                                      | SUBCODE101                       |
| SVC numbers               |                                      | SVC255 (DECIMAL)                 |
| Trace entry function code |                                      | TRACEE6 (DL/I)<br>TRACE03 (DISP) |
| XRF environments          | XRF<br>Takeover<br>Alternate         | IMSXRF<br>TAKEOVER<br>ALTERNATE  |

## Dependency keywords

Dependency keywords can be used with the keyword string to select only those APARs that apply to a certain environment. These keys are useful when a search yields a large number of hits and you suspect that the program failure occurs only in a specific environment.

| Keyword    | Environment                                                | Keyword  | Environment              |
|------------|------------------------------------------------------------|----------|--------------------------|
| D/CICS     | CICS                                                       | D/TRKREC | Track Recovery           |
| D/CONVPROC | Conversational<br>Processing                               | D/TWX    | Teletype                 |
| D/FP       | Fast Path                                                  | D/UCF    | Utility Control Facility |
| D/GSAM     | GSAM                                                       | D/VSAM   | VSAM                     |
| D/HDAM     | HDAM                                                       | D/VTAM   | VTAM                     |
| D/HIDAM    | HIDAM                                                      | D/1050   | 1050 Device Type         |
| D/IRLM     | MS/VS Resource Lock Manager<br>(Intersystem Communication) | D/2260   | 2260 Device Type         |
| D/MFS      | Message Format Service (MFS)                               | D/2770   | 2770 Device Type         |
| D/MSC      | Multiple System Coupling                                   | D/2980   | 2980 Device Type         |
| D/MVS      | z/OS                                                       | D/3270   | 3270 Large Screen        |
| D/None     | No dependencies                                            | D/3270L  | 3270 Local               |
| D/OSAM     | OSAM                                                       | D/3270R  | 3270 Remote              |
| D/SB       | Sequential Buffering                                       | D/3274   | 3274 Device Type         |
| D/SECINDX  | Secondary Index                                            | D/3276   | 3276 Device Type         |
| D/SHISAM   | Simple HISAM                                               | D/3278   | 3278 Device Type         |
| D/SLU1     | VTAM Type SLU 1                                            | D/3279   | 3279 Device Type         |
| D/SLU2     | VTAM Type SLU 2                                            | D/3284   | 3284 Device Type         |
| D/SLU4     | VTAM Type SLU 4                                            | D/3286   | 3286 Device Type         |
| D/SLU P    | VTAM Type SLU P                                            | D/3287   | 3287 Device Type         |
| D/SYSGEN   | PTFs that should be<br>applied prior to system definition  | D/3350   | 3350 Device Type         |
|            |                                                            | D/3375   | 3375 Device Type         |
|            |                                                            | D/3380   | 3380 Device Type         |
|            |                                                            | D/3600   | 3600 Device Types        |

**Keyword**      **Environment**

**Keyword**

**Environment**

D/3790

3790 Device Types

## Searching the database

---

To find out if a problem like the one you experienced has already been reported, you use the keyword string you completed to search an IBM Software Support database (such as Software Support Facility), or you can use it when talking to your Level 1 support representative.

1. Determine the maintenance level of the IMS system by identifying the APARs and PTFs that have been applied.

- Run the SMP PTF list program or have access to online SMP/E dialogs.

**Tip:** You can extract the current maintenance level of your IMS system (or of a specific IMS load module) by using the `/DIAGNOSE SNAP MODULE(modname)` command.

2. Search SSF, using the keyword string developed by following procedures from “[Selecting the keywords](#)” on page 32. Your search is most successful if you follow these guidelines:

- Start with a broad search argument so you receive all problem descriptions that might match your problem.
- If you find too many Authorized Program Analysis Reports (APARs) to examine, add the logical operators **AND** or **OR** to the keyword string in various combinations gradually to reduce the number of database matches (hits). If the keywords are connected by the logical operator **AND** (a blank), a record is selected if it contains both words separated by the blank. If the keywords are connected by the logical operator **OR** (`|`), a record is selected if it contains either of the words separated by the character, `|`.
- You can use dependency keywords with the keyword string to select only those APARs that apply to a certain environment. These can be particularly useful when a search yields a large number of database matches and you are almost certain that the program failure occurred in a specific environment. For the list of dependency keywords, see “[Dependency keywords](#)” on page 63.

**Recommendation:** Use dependency keywords only if you are sure the problem is limited to that dependency. If you do not get any database matches, eliminate the dependency keyword.

- If you want to narrow the search to a specific release level, you can add the logical operators **AND** or **OR** for the release level keywords to the search argument. The following list describes the release level keywords for IMS 14:

**AR100**

IMS Services

**AR101**

Database Manager

**AR102**

Transaction Manager

**AR103**

Extended Terminal Option

**AR104**

Recovery-level Tracking

**AR105**

Database-level Tracking

**AR106**

IMS Java™ On Demand features

**R220**

Internal Resource Lock Manager (IRLM) 2.2

**R230**

Internal Resource Lock Manager (IRLM) 2.3

For a structured database search, the release level keywords are:

**LVLS/100**

IMS Services

**LVLS/101**

Database Manager

**LVLS/102**

Transaction Manager

**LVLS/103**

Extended Terminal Option

**LVLS/104**

Recovery-level Tracking

**LVLS/105**

Database-level Tracking

**LVLS/106**

IMS Java On Demand features

**LVLS/R220**

Internal Resource Lock Manager (IRLM) 2.2

**LVLS/R230**

Internal Resource Lock Manager (IRLM) 2.3

Examples:

- For the Database Manager, type
- For a structured database search, type:

**Tip:** If you do not get any database matches, remove the release level from your search argument.

3. Eliminate the APARs that also appear in the SMP PTF list from the list of database matches. These will have already been applied.
4. Compare each remaining APAR with the current failure symptoms. Analyze trace output for your problem situation, looking for similarities in the situations described by APARs that you are reviewing. Frequently, APAR descriptions include information about the traces that were run for those problems.
5. If you find an appropriate APAR, determine if it has been closed. If it has been closed, you can correct the problem by applying the fix that is associated with the APAR. If it has not been closed, contact IBM Software Support for information about what you can do until it is closed.
6. If you do not find an appropriate APAR, verify that the problem is not caused by a user specification error.
7. If you find no user specification error, contact IBM Software Support for assistance.

## Procedures for preparing an APAR

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An Authorized Program Analysis Report (APAR) might be necessary if the keyword search proves unsuccessful. Call IBM Software Support for help in determining if an APAR is necessary. Only authorized IBM personnel can generate APARs.

The information in the following table describes the procedures for preparing an APAR.

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Table 6. Procedures for preparing an APAR

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| Procedure                    | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reporting a problem          | <p>To report a problem, contact IBM Software Support. Be prepared to supply such information as:</p> <ul style="list-style-type: none"><li>• Customer number.</li><li>• Release level.</li><li>• Current maintenance level (from PTF list).</li></ul> <p><b>Tip:</b> You can extract the current maintenance level of your IMS system (or of a specific IMS load module) from your IMS system by using the /DIAGNOSE SNAP MODULE(<i>modname</i>) command.</p> <ul style="list-style-type: none"><li>• The keyword string or strings used to search the IBM Software Support database.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Gathering APAR documentation | <p>You might be asked to supply various types of information that describe the IMS nucleus, database, environment, or activities. Include applicable items from the following list with the APAR.</p> <ul style="list-style-type: none"><li>• JCL listings</li><li>• Address space storage dumps at time of failure—the entire machine-readable dump data set (normally copied to tape) and the JCL used to copy the dump to tape</li><li>• Bind map</li><li>• z/OS console printout. A partial console is generally in the offline formatted dump.</li><li>• Master terminal printout</li><li>• Local/remote terminal printout</li><li>• IMS log data sets</li><li>• IMSGEN listing</li><li>• DBD listing</li><li>• PSB listing</li><li>• ACB generation output</li><li>• Log trace</li><li>• Consolidated trace output</li><li>• Transmittal notes explaining any unusual events leading up to the problem symptoms</li><li>• SNAPs produced before and after the failing call by DFSDDLTO</li><li>• Type X'67FF' SNAP log records</li><li>• Type X'6705' SNAP log records</li><li>• DBRC RECON data set</li><li>• LPA map</li><li>• LOGREC (especially software diagnostic records)</li></ul> |

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*Table 6. Procedures for preparing an APAR (continued)*

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| <b>Procedure</b>              | <b>Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Submitting APAR documentation | <p>When submitting material for an APAR to IBM, carefully pack and clearly label all materials sent to IBM with the following information:</p> <ol style="list-style-type: none"><li>1. The APAR number assigned by IBM</li><li>2. A list of data sets on the tape, including JCL, if any</li><li>3. A description of how the tape was made, including:<ul style="list-style-type: none"><li>• The exact JCL listing or the list of commands used</li><li>• The recording mode and density</li><li>• Tape labeling</li><li>• The record format and block size used for each data set</li></ul></li></ol> |

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## Chapter 5. Data areas and record formats

This section describes the major IMS control blocks and their interrelationships. It also describes the formats of records that you need to analyze when diagnosing problems.

### Finding more information on modules, control blocks, and record formats

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You can find the module directory, IMS control block DSECTs, and the log record formats on Service Link. Contact your systems engineer for further information on accessing Service Link.

#### Control block linkage

The IMS.ACBLIB is a partitioned data set whose members are pre-system-generated, expanded PSB and DMB control blocks. You can view the formats of these control blocks by assembling the database DSECT and CSECT control blocks macro IDLI. You can also find the layout of IMS.ACBLIB members in the ACBGEN module, DFSUACB0, and the Write-PSBs-and-DMBs-to-ACBLIB module, DFSUAMB0.

The following figure provides an overview of the linkage between the major control blocks used for diagnosis.

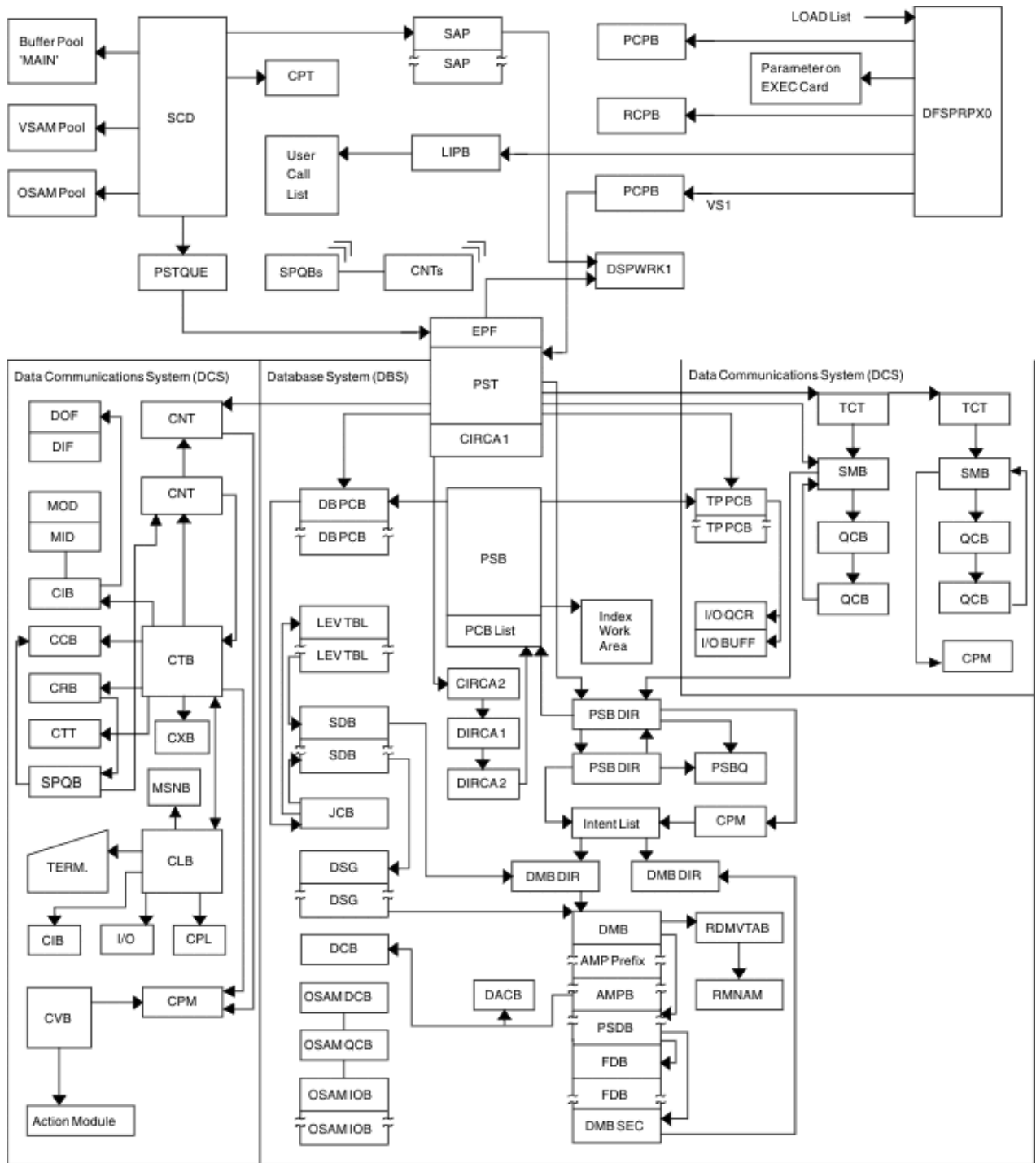


Figure 3. IMS control block linkage for a static DB/DC environment

## Table of control block definitions

All of the control blocks are listed, and for each control block the acronyms, macros and descriptions are given.

Table 7. Control block definitions

| Control block acronym | Mapping macro | Description                  |
|-----------------------|---------------|------------------------------|
| ADSC                  | DBFADSC       | Area data set control block. |

Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                         |
|------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| ALDS                         | DBFAREA              | Area list data set.                                                                                                                        |
| AMPB                         | IDLI DMBASE=0        | Access method prefix block. Contains information relative to a data set belonging to a database.                                           |
| BALG                         | DBFBALG              | Balancing group control block.                                                                                                             |
| BFSP                         | IDLIVSAM BFSP        | DL/I VSAM buffer handler pool prefix.                                                                                                      |
| BFUS                         | IDLIVSAM BFUS        | Subpool statistics block.                                                                                                                  |
| BHDR                         | BHDR                 | MSDB header.                                                                                                                               |
| BLOCKHDR                     | DFSSPBLK             | Block header used by DFSPPOOL Storage Manager.                                                                                             |
| BSPH                         | IDLIVSAM BSPH        | Buffer subpool header block. Contains the number of buffers in this subpool.                                                               |
| BUFC                         | IDLIVSAM BUFC        | Buffer control block. Contains pointers to buffers.                                                                                        |
| BUFENTRY                     | DFSSPBLK             | Used by DFSPPOOL Storage Manager to map the buffer size entries within the pool header.                                                    |
| CADSECT                      | ICADSECT             | Communication area block. Contains the main dump formatter control block.                                                                  |
| CBT                          | DFSCBTS              | Control block. Represents storage pools (IPAGES) defined in DFSCBT00.                                                                      |
| CCB                          | ICLI CCBASE=0        | Conversational control block. Controls resources for conversational tasks.                                                                 |
| CIB                          | ICLI CIBBASE=0       | Communication interface block. Contains information the device-dependent module needs to determine Message Format Service (MFS) operation. |
| CIRCA                        | IPST                 | IMS control region interregion communication area.                                                                                         |
| CLB                          | ICLI CLBBASE=0       | Communication line block. One exists for each communication line and for each node.                                                        |
| CLLE                         | DFSCILLE             | Common Latch List Element. There is one block for each IMS ITASK, which is maintained in Key 7 storage.                                    |
| CNT                          | ICLI CNTBASE=0       | Communication name table. One exists for each named logical terminal and component.                                                        |
| CPM                          | (generated)          | Communication password matrix. Length varies based upon the number of passwords in the CPT.                                                |
| CPT                          | (generated)          | Communication password table. Defined by user.                                                                                             |
| CRB                          | ICLI CRBBASE=0       | Communication restart block.                                                                                                               |
| CSAB                         | OCO                  | Callable Service Anchor Block. Used by IMS callable services modules.                                                                      |
| CSVT                         | DFSCSVT              | Callable Services Vector Table. Used by IMS callable services modules.                                                                     |
| CTB                          | ICLI CTBBASE=0       | Communication terminal block. One exists for each terminal and for each subpool in the system.                                             |

Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                               |
|------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CTM                          | (generated)          | Communication terminal matrix. Length varies based upon the number of logical terminals (CNTs).                                                                                                                                                                                                                                  |
| CTT                          | ICLI CTTBASE=0       | Communication terminal table. There is one for each different type of terminal, as well as different features.                                                                                                                                                                                                                   |
| CULE                         | DFSCULE              | Common Use List Element. Used in latching by the IMS Use Manager.                                                                                                                                                                                                                                                                |
| CVB                          | ICLI CVBBASE=0       | Communication verb block. Reflects the relationship between the command message verbs and the passwords. It also reflects logical terminals associated with those commands.                                                                                                                                                      |
| CXB                          | (generated)          | Communication extension block. Contains information that is required for control of a particular terminal. It is a logical extension of the CTB.                                                                                                                                                                                 |
| DBPCB                        | IDLI DPCBASE=0       | DL/I DB PCB.                                                                                                                                                                                                                                                                                                                     |
| DCB                          | IDCBOSD              | Data communication block. Contains data pertinent to the current use of a data set.                                                                                                                                                                                                                                              |
| DCB-EXT                      | DFSDCBEX             | OSAM extension to the DCB.                                                                                                                                                                                                                                                                                                       |
| DDIR                         | IDLI DDRBASE=0       | DMB directory entry. Contains an entry for each DMB known to IMS.                                                                                                                                                                                                                                                                |
| DFSAVEC                      | DFSAVECT             | Dump formatter vector table.                                                                                                                                                                                                                                                                                                     |
| DFSDOPE                      | DFSDOPTB             | Dump option entry block. It is the dump formatter CBTE request definition block.                                                                                                                                                                                                                                                 |
| DFSDPBFH                     | DFSDPBFH             | Dump buffer pool blocks. Used for buffering offline dump storage.                                                                                                                                                                                                                                                                |
| DFSSBWO                      | DFSSBWA              | Work area used by sequential buffering.                                                                                                                                                                                                                                                                                          |
| DMAC                         | DBFDMAC              | DEDB area control block.                                                                                                                                                                                                                                                                                                         |
| DMB                          | IDLI DMBBASE=0       | Data management block. There is one for each database descriptor entry described in the DDIR.                                                                                                                                                                                                                                    |
| DMBSEC                       | IDLI DMBBASE=0       | Secondary list. There is one or more entry for each logically related segment and each index relationship.                                                                                                                                                                                                                       |
| DMCB                         | DBFDMCB              | DEDB master control block.                                                                                                                                                                                                                                                                                                       |
| DMHR                         | DBFDMHR              | The buffer header for Fast Path. Describes the status of a particular buffer. The buffer headers (and buffers) are allocated in DBFCNT0. ESCDDMHR points to the first buffer and ESCDMBFN contains the number of headers. The relationship between buffer headers and buffers is fixed during IMS control region initialization. |
| DSEB                         | DFSDSPDS             | Dynamic SAP Extension Block. Used to manage dynamic SAPs.                                                                                                                                                                                                                                                                        |
| DSG                          | IDLI DSGBASE=0       | Data set group control block. There is typically one for each data set group referenced by the DBPCB.                                                                                                                                                                                                                            |
| DSPWRK1                      | IDSPWRK              | Dispatcher work area. There is one for each VS task (TCB) in an IMS environment.                                                                                                                                                                                                                                                 |

Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                  |
|------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECB                          | z/OS macro           | Event control block. Describes the status of an event in an IMS environment.                                                                                                                                                                                                                                                        |
| ECNT                         | DBFECNT              | Extended communications name table. (Fast Path)                                                                                                                                                                                                                                                                                     |
| EDSG                         | DFSSBD SG            | Sequential buffering extension to the DSG.                                                                                                                                                                                                                                                                                          |
| EMHB                         | DBFEMHB              | Expedited message handler block. (Fast Path)                                                                                                                                                                                                                                                                                        |
| EIB                          | DFSPCA               | Partition Exit Interface Block Prefix.                                                                                                                                                                                                                                                                                              |
| EPCB                         | DBFEPCB              | Extended PCB. (Fast Path)                                                                                                                                                                                                                                                                                                           |
| EPF                          | IEPF                 | ECB prefix. Used to indicate the current status of the ECB and to connect the ECB to the appropriate SAP.                                                                                                                                                                                                                           |
| EPST                         | DBFEPST              | Extended partition specification table. (Fast Path)                                                                                                                                                                                                                                                                                 |
| EQEL                         | DFSEQEL              | Recoverable in-doubt structure queue elements. Identifies inaccessible data due to in-doubt status.                                                                                                                                                                                                                                 |
| ESCD                         | DBFESCD              | Extended system contents directory. (Fast Path)                                                                                                                                                                                                                                                                                     |
| ESRB                         | DBFESRB              | Extended service request block. (Fast Path)                                                                                                                                                                                                                                                                                         |
| ESRT                         | DBFESRT              | Expedited message handling region insert buffer. This buffer is a temporary save area for a message input. ESRTs are allocated in module DBFCNT0 by IMS control region initialization with a length equal to the largest terminal buffer defined. ESCDESRT points to the first ESRT. EPSTESRT points to a related ESRT. (Fast Path) |
| FAQE                         | DFSSPBLK             | Free allocated queue element. Used by the DFSISMNO Storage Manager to manage storage within a pool.                                                                                                                                                                                                                                 |
| FDB                          | IDLI FDBBASE=0       | Field descriptor block.                                                                                                                                                                                                                                                                                                             |
| FDT                          | DBFMFDB              | Field description table.                                                                                                                                                                                                                                                                                                            |
| FEDB                         | ICLI FEDBBASE=0      | Front end directory block. Stores global information about the front end switching facility.                                                                                                                                                                                                                                        |
| FEIB                         | ICLI FEIBBASE=0      | Front end interface block. Contains data to allow the front end switching user exit to communicate with the transaction manager.                                                                                                                                                                                                    |
| FRB                          | DFSFRB               | Fast restart block.                                                                                                                                                                                                                                                                                                                 |
| GB                           | IGLI                 | GSAM data set control block. Contains information concerning the data set operation and pointers to other control blocks used for accessing records.                                                                                                                                                                                |
| GBCB                         | IGLI                 | GSAM buffer control block. Contains the address of a unique buffer.                                                                                                                                                                                                                                                                 |
| GLT                          | IGLI                 | GSAM load table. Provides all addresses of the GSAM load modules necessary for initialization.                                                                                                                                                                                                                                      |
| GPT                          | IGLI                 | GSAM pointer table. Provides information required by resident and nonresident GSAM routines.                                                                                                                                                                                                                                        |
| GQCB                         | IGLI                 | GSAM queues control block. Contains first and last pointers for the four queues of GSAM GBCBs used by GSAM BUFFIO.                                                                                                                                                                                                                  |

Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HSSR                         | DBFHSSR              | Holds area range information from SETR statements. HSSR is formatted in the offline dump.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| HSSO                         | DBFHSSO              | Holds image copy (IC) information from SETO statements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HSSD                         | DBFHSSD              | Holds information for the /DISPLAY HSSP command. HSSD is formatted in the offline dump.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HSSP                         | DBFHSSPS             | Skeleton block. Temporarily holds HSSO/HSSR/HSSD information before scheduling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| IBFPRF                       | IBFPRF               | Buffer prefix. There is one for each buffer described in each subpool used by the OSAM buffer manager.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| IBPOOL                       | IBPOOL               | OSAM buffer handler main buffer pool. Contains statistics and vectors to OSAM buffer subpools.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| IDSC                         | DBFIDSC              | IDSC is the image copy data set control block. It represents the Image Copy data set (IDS) the same way the area data set control block (ADSC) represents the area data set (ADS). IDSC also uses the same control block structure as the ADSC. An IDSC contains a description of the Image Copy data set. There are up to two IDSCs for each DEDB area with the Image Copy option. An IDSC is built dynamically at the first call to the area that is running as HSSP with the Image Copy option requested. The IDSC is released during Image Copy termination.<br><br>The IDSC control block is formatted in the offline dump. |
| IEEQE                        | DFSIEQE              | In-doubt error queue element. Contains buffers of changed data (data in the in-doubt state).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ISPL                         | ISUBPL               | OSAM buffer subpool. Provides a base for fixed length buffers and statistics about the buffers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ISL                          | DXRRILSL             | IRLM identified subsystem list. Contains the name of each subsystem and its status.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| JCB                          | IDLI JCBBASE=0       | Job control block. There is one for each PCB. It contains level tables and segment blocks and a trace table of the previous calls.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| LCB                          | LCB                  | Link control block. Represents the link for channel to channel, memory to memory, VTAM, and binary synchronous connections in MSC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| LCD                          | LCDSECT              | Log contents directory. Controls the interface between the logical and physical loggers in a DB/DC environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| LCRE                         | DFSLCRE              | Local current recovery element. Contains the sync point, checkpoint recovery information relative to each PST.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| LEV                          | IDLI LEVBASE=0       | Level table. Consists of two parts: previous call and current call that is filled in by the call analyzer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| LIPARMS                      | PARMBLK              | Language interface parameter block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LLB                          | ICLI CLBBASE=0       | Link line block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LTB                          | ICLI CTBBASE=0       | Link terminal block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| LXB                          | LXB                  | Link extension block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                                                              |
|------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MRMB                         | DBFMRGB              | DEDB randomizing module block.                                                                                                                                                  |
| MSNB                         | MSNB                 | Message Control/Error exit interface block. Contains the block content before and after calling Message Control/Error exit DFSCMUX0 or during the interface processing.         |
| PAC                          | DFSPAC               | Database Resource Adapter (DRA) control block.                                                                                                                                  |
| PAPL                         | DFSPAPL              | DRA architected parameter list.                                                                                                                                                 |
| PARMLIST                     | ICADSECT             | Dump formatter bulk print interface block.                                                                                                                                      |
| PAT                          | DFSPAT               | DRA thread control block.                                                                                                                                                       |
| PATE                         | DFSPAT               | DRA thread entry control block.                                                                                                                                                 |
| PCA                          | DFSPCA               | Partition Communication Area.                                                                                                                                                   |
| PCIB                         | ICLI PCIBASE=0       | Partition communication interface block.                                                                                                                                        |
| PCPARMS                      | PARMBLK              | Program control parameter block.                                                                                                                                                |
| PCT                          | DFSPCT               | Partition chaining table.                                                                                                                                                       |
| PDAE                         | DFSPSEIB             | Partition Definition Area Prefix. Partition Definition Area Entry.                                                                                                              |
| PDEX                         | DFSDDIR              | Partition Directory Extension                                                                                                                                                   |
| PDIR                         | IDLI PDRBASE=0       | Program specification block directory. Contains entries for every program known to IMS.                                                                                         |
| PDL                          | DFSPDL               | DRA dump parameter list.                                                                                                                                                        |
| PECA                         | DFSPSEIB             | Partition Exit Communication Area.                                                                                                                                              |
| PNT                          | DFSPNT               | Partition Name Table.                                                                                                                                                           |
| POOLHDR                      | DFSSPBLK             | Storage pool header used by the DFSPPOOL storage manager to keep track of pool information.                                                                                     |
| PPRE                         | DFSPPRE              | Standard IPAGE prefix mapping macro. Used for all IPAGEs created in IMS.                                                                                                        |
| PQE                          | DFSPQE               | DRA queuing element.                                                                                                                                                            |
| PSB                          | IDLI PSBBASE=0       | Program specification block. Relates to the application program and contains the PCBs associated with this PSB.                                                                 |
| PSDB                         | IDLI DMBASE=0        | Physical segment descriptor block. Describes each segment in the database.                                                                                                      |
| PST                          | IPST                 | Partition specification table. There is one for each message or batch region; it contains a DECB for this partition, I/O terminal PCB, and parameters required for this region. |
| PTBWA                        | DXRPTBWA             | IRLM pass-the-buck work area.                                                                                                                                                   |
| PTE                          | DFSPNT               | Partition Table Entry.                                                                                                                                                          |
| PTK                          | DFSPTK               | Partition Key Index Table.                                                                                                                                                      |
| PTX                          | DFSPTX               | Partition Entry Index Table.                                                                                                                                                    |
| PXPARGS                      | PARMBLK              | Parameter Anchor Block.                                                                                                                                                         |

Table 7. Control block definitions (continued)

| <b>Control block acronym</b> | <b>Mapping macro</b> | <b>Description</b>                                                                                                                                                                                                                                   |
|------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QCB                          | IAPS SMBBASE=0       | Queue control block.                                                                                                                                                                                                                                 |
| QEL                          | IAPS SMBBASE=0       | Queue Element.                                                                                                                                                                                                                                       |
| QMBA                         | DFSQMGR              | Queue Manager Buffer Area.                                                                                                                                                                                                                           |
| RCPARMS                      | IDLI PSTBASE=0       | Region control parameter block.                                                                                                                                                                                                                      |
| RCTE                         | DBFRCTE              | Routing code table entry.                                                                                                                                                                                                                            |
| RDLWA                        | DXRRDLWA             | IRLM deadlock process work area. Contains information that must be communicated between the deadlock process modules.                                                                                                                                |
| RHB                          | DXRRHB               | IRLM resource header block. Represents a resource.                                                                                                                                                                                                   |
| RHT                          | DXRRHT               | IRLM resource hash table. Provides a series of anchors for resource chains.                                                                                                                                                                          |
| RLB                          | DXRRLB               | IRLM resource lock block. Represents a request for a lock or a lock held on a resource.                                                                                                                                                              |
| RLCBT                        | DXRRLCBT             | IRLM private area control block and table. Contains addresses of IRLM entry points.                                                                                                                                                                  |
| RLMCB                        | DXRRLMCB             | IRLM master control block. Contains branch entry addresses for all RLMREQ as well as queue anchors.                                                                                                                                                  |
| RLPL                         | DXRRLPL              | IRLM request parameter list. This is the parameter list for all functional requests for the resource lock manager.                                                                                                                                   |
| RLQD                         | DXRRLQD              | IRLM query mapping macro. Maps IRLM control blocks/structures returned to the IMS invoker of QUERY.                                                                                                                                                  |
| RPL                          | IDLIVSAM             | Request parameter list. Contains parameters passed to VSAM from IMS and the status returned to IMS from VSAM.                                                                                                                                        |
| RPST                         | DFSRPST              | Restart PST. Contains identifying information and characteristics of units of recovery.                                                                                                                                                              |
| RRE                          | DFSRRE               | Residual recovery element. Contains sync point actions, such as Commit and Abort, relative to eachDb2 for z/OS connection out of a dependent region and is used for BMP restart processing, in-doubt processing, and restartable backout processing. |
| SAP                          | ISAP                 | Save area prefix. Relates to a save area set.                                                                                                                                                                                                        |
| SBHE                         | DFSSBHE              | Sequential buffering hash entry. Used to hash or anchor SDCB control blocks and to serialize the sequential buffer SDCB and SDSG control block subsystem chains. The SBHEs are part of the SBSCD.                                                    |
| SBPARMS                      | DFSSBPAR             | Sequential buffering extension to PXPparms.                                                                                                                                                                                                          |
| SBPSS                        | DFSSBPSS             | Small section of the SBPST that needs to be in CSA.                                                                                                                                                                                                  |
| SBPST                        | DFSSBPST             | Sequential buffering extension to the PST.                                                                                                                                                                                                           |
| SBSCD                        | DFSSBSCD             | Sequential buffering extension to the SCD. This extension contains the SBHE hash entries.                                                                                                                                                            |
| SBUE                         | DFSSBBUF             | Sequential buffering buffer extension. There is one SBUE for each SBUF.                                                                                                                                                                              |

Table 7. Control block definitions (continued)

| Control block acronym | Mapping macro    | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SBUF                  | IBFPRF SBEXT=YES | Sequential buffering buffer. One SBUF control block is used by sequential buffering to control each SB buffer. The SBUF control blocks of one SB buffer pool are contiguous in storage and are formatted as one entity.                                                                                                                                                                                           |
| SCAR                  | DFSSBCAR         | Control block containing the interpreted data of one SBPARM control statement in the //DFSCTL file.                                                                                                                                                                                                                                                                                                               |
| SCA1                  | DFSSBCAR         | Control block containing the uninterpreted data of one SBPARM control statement in the //DFSCTL file.                                                                                                                                                                                                                                                                                                             |
| SCD                   | ISCD             | System contents directory. Produced at system definition time, it contains major entry points for all facilities and system control information.                                                                                                                                                                                                                                                                  |
| SDB                   | IDLI SDBBASE=0   | Segment descriptor block. Contains a logical description of the segment.                                                                                                                                                                                                                                                                                                                                          |
| SDCB                  | DFSSBCDB         | Sequential buffering extension to the DCB. Is for those DB data sets that are buffered by sequential buffering.                                                                                                                                                                                                                                                                                                   |
| SDSG                  | DFSSBDSG         | Sequential buffering extension to the DSG. Describes one I/O process. There is typically one SDSG control block for each data set group control block (DSG) that might potentially be buffered by sequential buffering.                                                                                                                                                                                           |
| SDWA                  | IHASDWA          | System diagnostic work area.                                                                                                                                                                                                                                                                                                                                                                                      |
| SGT                   | DFSPRSGT         | Segment table. Describes the segments used by the partial reorganization process. It is built during the DBD analysis phase. Its address is held in the common area field (COMASGT). The segment extension table (SGX) holds additional information about the segments.                                                                                                                                           |
| SIDB                  | DXRSIDB          | IRLM subsystem identification block. Used to identify each subsystem that relates to IRLM.                                                                                                                                                                                                                                                                                                                        |
| SIDX                  | DFSSSIE          | Subsystem index entry.                                                                                                                                                                                                                                                                                                                                                                                            |
| SMB                   | IAPS             | Scheduler message block. Related to a transaction.                                                                                                                                                                                                                                                                                                                                                                |
| SPQB                  | ICLI SPQBASE=0   | Subpool queue block. The SPQB represents the dynamic user for an ETO terminal and represents a set of static queues (CNTs) for a static ISC parallel session terminal.                                                                                                                                                                                                                                            |
| SQPST                 | ISQPST           | PST queue. Associated with the scheduler sequence queue.                                                                                                                                                                                                                                                                                                                                                          |
| SRAN                  | DFSSBRAN         | Sequential range. Used in sequential buffering to describe a recently referenced set of consecutive DB blocks. Sequential buffering allocates one Sequential SRAN control block for each buffer set of each buffer pool. SB also allocates Random SRAN control blocks to each buffer pool. The Sequential SRANs and Random SRANs of one SB buffer pool are contiguous in storage and are formatted as one entity. |
| SSIB                  | IEFJSSIB         | Subsystem identification block. Identifies the subsystem that requested services.                                                                                                                                                                                                                                                                                                                                 |

Table 7. Control block definitions (continued)

| Control block acronym | Mapping macro  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SSOB                  | IEFJSSOB       | Subsystem options block. Used to request a particular function from the z/OS subsystem.                                                                                                                                                                                                                                                                                                                                                                                                     |
| SSVP                  | DFSSSVPL       | System Services Parameter List. Used by IMS System Macros for parameter lists for mailing out of line calls. There is one SSVP per ITASK, anchored off of the SAP.                                                                                                                                                                                                                                                                                                                          |
| TAB                   | DFSTAB         | Transaction anchor block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| TCT                   | DFSTAB         | Transaction class table. Used for queuing of messages in a priority sequence within a specified class.                                                                                                                                                                                                                                                                                                                                                                                      |
| TPPCB                 | IDLI TPCBASE=0 | Program communication block. There is one for each logical database being referenced by the application program.                                                                                                                                                                                                                                                                                                                                                                            |
| UEHB                  | UEHB           | User exit header block. Used for automated operator exit interface processing.                                                                                                                                                                                                                                                                                                                                                                                                              |
| UXDT                  | DFSUSRX        | User Exit Definition Table. Contains control information and user exit addresses for user exits managed by IMS standard user exit service.                                                                                                                                                                                                                                                                                                                                                  |
| UXRB                  | DBRUXRB        | <p>A unit of work (UOW) is represented by a UOW exclusive resource control block (UXRB), similar to the XCRB representing the CI. The UXRb contains information about the UOW (for example, Area, RBA) and is used for resolving potential UOW resource contention among dependent regions. Other UXRb fields include the lock token, number of associated XCRBs, the owning EPST, the update intent flag, and the PCB.</p> <p>The UXRb control block is formatted in the offline dump.</p> |
| VSI                   | IDLIVSAM VSI   | VSAM sharing information control block. Controls VSAM sharing between subsystems.                                                                                                                                                                                                                                                                                                                                                                                                           |
| WHB                   | DXRWHB         | IRLM work unit block. Contains the anchor for all requests associated with that owner.                                                                                                                                                                                                                                                                                                                                                                                                      |
| XCRB                  | DBFXCRB        | Exclusive control resource block.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| XMCA                  | DFSXMC         | Cross-Memory Control-Address Spaces. There is one block for each IMS subsystem, which is maintained in Key 0 storage.                                                                                                                                                                                                                                                                                                                                                                       |
| XMCI                  | DFSXMC         | Cross Memory Control-ITASKs. There is one block for each IMS ITASK, which is maintained in Key 7 storage.                                                                                                                                                                                                                                                                                                                                                                                   |
| ZIB                   | IZIB           | Zone initialization block. Used by the DFSISMNO Storage Manager to keep track of a buffer obtained using ICREATE.                                                                                                                                                                                                                                                                                                                                                                           |

**Related reference**

[“Contents formatted for FMTIMS options” on page 578](#)

FMTIMS options can be specified on the FMTIMS statement in any order.

## IMS Control Block Table (CBT) Pools

---

The IMS CBT storage manager (also known as the DFSBCB storage manager) manages pools of fixed-length control blocks.

All CBT pools can be displayed by issuing the **/DISPLAY POOL CBT**. Issuing the **/DISPLAY POOL** command with other keywords, such as DBB, DCC, DEP, DISP, FP, GEN, OSAM, SUM, and others, limits the display of the CBT pools to those related to the functional area of IMS that the keyword represents.

All of the CBT pools are briefly described in the following alphabetical list.

**AAB**

RSR Archive anchor block

**ADSC**

Fast Path area data set control block

**AESL**

Fast Path DEDB ADS list

**AHDR**

ETO autologon LU header/ autologon hash table synonym

**APST**

Partition specification table - above the line

**ATPW**

Attach catalog PSB work area block

**AWE**

Asynchronous work element

**BCPT**

Checkpoint id table

**BQEL**

ISAM/OSAM/VSAM buffer queue element

**BXQE**

BCB queue elements for use by DFSBCBxx modules only

**CATR**

IMS catalog request block

**CBLK**

Used in place of message queue to keep track of CPI-C scheduling requests

**CCB**

Conversational control block

**CFEZ**

Block used to store local parms for DC trace re-entrancy

**CLLE**

Common latch list element

**CM24**

Common work unit, 24-bit

**CMWU**

Common work unit

**CRSP**

OM command response block

**CSAG**

Callable services anchor block (CSAB) - global storage

**CSAL**

Callable services anchor block (CSAB) - local storage

**CSWA**  
Common system work area - global storage

**CTBW**  
Communication terminal block work area

**CULE**  
Common use list element

**D1WA**  
Dispatcher work area 1

**DACT**  
DL/I call accounting block

**DBBD**  
Database (DDIR) descriptor

**DBPB**  
Data base purge block

**DBRC**  
DBRC work area

**DCM**  
RSR Deferred ILT control message

**DDIR**  
DMB directory entry

**DDRE**  
DMB directory extension

**DESC**  
LU 6.2 descriptor block

**DG2W**  
Global dispatcher area

**DL2W**  
Local dispatcher area

**DLWA**  
DL/I private work area

**DMAC**  
Fast Path DEDB area control block for dynamic areas

**DMHR**  
Fast Path VSO dynamic DHMRs for write staging area

**DPST**  
Dependent region PST

**DPXB**  
Dispatcher extension block

**DSME**  
Fast Path data space mapping entry

**DSML**  
Fast Path data space mapping list

**EMAC**  
RSR Extended DMAC

**EPST**  
Fast Path extended PST

**EQEL**  
Resolve indoubt structure queue element

**EZS**  
External connection status element

**FEIB**  
Front end message switch interface block

**FMMC**  
Fast Path control block to contain VSAM extents

**FNCB**  
Fast Path notify control block

**FPB6**  
Fast Path DBFBPND6 block for FP 64-bit buffer pools

**FPCP**  
Fast Path command parameter list

**FSRB**  
Fast Path SRB

**GDS**  
RSR Gap descriptor

**GESE**  
Global external subsystem entry

**GIOB**  
Global IOSB

**GOWA**  
Global OSWA

**GPNT**  
Fast Path global name table

**GQMW**  
Global queue manager work area

**GSAV**  
Global save area

**HSHE**  
Hash table element header

**HSHS**  
Hash table slot header

**HTEB**  
BPE LFS hash table services: hash table element block, CTL private

**HTED**  
BPE LFS hash table services: hash table element block, DLI private

**IAFP**  
IAFP dataset control block

**IBKD**  
Interface Block for user exit services in DL/I region private storage. The IBKC control block is used for working storage and a parameter list when invoking a user exit through IMS DFSUSRX user exit service.

**IBKP**  
Interface Block for user exit services in control region private storage. The IBKP control block is used for working storage and a parameter list when invoking a user exit through IMS DFSUSRX user exit service.

**IDT**  
Identify table entry

**IEQE**  
Inflight/indoubt data buffers

**IOSB**

I/O supervisor block

**IPST**

System PST in DLI/SAS private, 31-bit storage

**IRLM**

IRLM parameter area

**KLSD**

LSO dependent control block

**L56X**

Fast Path DBCTL log record

**LCLL**

Local common latch list element (local storage)

**LCRE**

Local current recovery entry

**LG24**

An LSAV below the 16m line

**LGND**

Logon descriptor control block sets

**LGWA**

Log work area

**LGWX**

Log work area extension (private)

**LPNT**

Fast Path local name table

**LPST**

Local PST block

**LQB**

Local queue block

**LQMW**

Local queue manager work area

**LRA**

RSR Log read area

**LS24**

24-bit quick block, local save area / AWE

**LSAV**

Local save area

**LSWA**

Local system work area

**LUB**

LUB pool below 16 MB line for LU 6.2

**LXB**

Dynamic link extension block for VTAM and TCP/IP links. The LXB control block is mapped by the LXB copy.

**MPB**

RSR Milestone position block

**MPCB**

PCB block for MSC bandwidth. The MPCB control block is mapped by the DFSMPCB macro.

**MSCL**

MSC logical link control blocks: LLB, two LTBs, and a CRB. The MSCL control block is mapped by the DFSMSCL macro.



**MSCP**

MSC physical link control blocks: LCB and CTT. The MSCP control block is mapped by the DFSMSCP macro.

**MSEB**

Work area for the TM and MSC Message Routing and Control User exit routine (DFSMSCEO). The MSEB work area is mapped by the DFSMSCEB macro.

**MSGP**

Message pool

**MUTE**

OTMA MCB user table entry

**OCMD**

OM command instance block

**OFB**

RSR Online forward recovery block

**OLRK**

OLR KSDS update entry

**OSWA**

OSAM work area (IOMA)

**OTDD**

OTMA destination descriptors

**OTMD**

OTMA member descriptors

**PCIB**

Partition CIB

**PDEX**

Partition directory extension

**PDIR**

PSB directory entry

**PF62**

Message prefix block for LU 6.2

**PFQE**

CQSPUT failure queue element

**PGMD**

Program (PDIR) descriptor

**PST**

Partition specification table

**QAB**

QAB pool for LU 6.2

**QLST**

Work area to hold queue manager parameter list

**QLTC**

DEDB and area quiesce latch blocks for DEDB Alter

**QMBA**

Queue manager buffer area (large message)

**QMBS**

Queue manager buffer area (small message)

**QQSN**

Queue space notification area

**QS24**

Temporary save area set with parm areas - 24-bit storage

**QSAV**

Temporary save area set with parm areas - 31-bit storage

**RACW**

RACF work area used for racinit, fracheck, etc.

**RBAT**

Fast Path VSO RBA update table entries

**RCNT**

Remote communication name table. The RCNT control block is mapped by the RCNT copy.

**RCTD**

Fast Path routing code (RCTE) descriptor

**RCTE**

Fast Path routing code table entry

**RECA**

VTAM receive any buffer

**RPST**

Restart partition specification table

**RRE**

Residual recovery entry

**RSCX**

Resource extension block

**SAA**

RSR Stream archive anchor

**SAP**

Save area prefix

**SIDX**

Subsystem index entry

**SLOG**

DC monitor work area

**SMB**

Scheduler message block

**SOPB**

Sign-on parameter block

**SPQX**

SPQB extension block

**SQOF**

Shared queues overflow hash table element

**SRA**

RSR Stream receive anchor

**SRBC**

Common SRB pool

**STAT**

DBCTL and DRA statistics area

**STB**

RSR Stream block

**STTR**

DL/I trace stacks

**SVPG**

System service parameter lists - global

**SVPL**

System service parameter lists - local

**TCBT**

TCB table

**TDBC**

RSR Tracking data base control

**TDCB**

RSR Tracking log data set DCB

**TIB**

TIB pool for LU 6.2

**TLS**

Transaction level statistics area

**TPIP**

TPIPE pool for OTMA

**TRND**

Transaction (SMB) descriptor

**TT24**

Trace table (24-bit storage)

**TT3P**

Trace table (31-bit, private storage)

**TTAB**

Trace table (31-bit storage)

**UOWE**

Unit of work table entry

**USRD**

User descriptor control blocks

**USTB**

RSR Update sequence number tracking block

**UXIC**

User exit instance (common)

**UXIP**

User exit instance (private)

**UXSC**

User exit static area (common)

**UXSP**

User exit static area (private)

**VRPL**

VSAM RPL/save area stack

**VTCB**

VTAM session control block

**VWA**

Volatile work area

**WLMB**

Work area of parameter list for the Workload Manager classification service.

**X124**

DL/I pool below 16m line

**XMCI**

Cross memory itask block

**XMCL**

Local XMCI block (ctl private)

**XPST**

Extended PST area (dependent region)

**XT62**

LU 6.2 and OTMA PST extension

**YQAB**

OTMA queue anchor block

## Control block interrelationship diagrams

---

These diagrams show the interrelationships between major control blocks in an IMS environment.

**Note:** This information is intended for users with experience in obtaining and reading IMS system dumps. The training course IMS Diagnostic Approaches provides an introduction to this information. Further information about this training course is available on the Information Management Training and Certification web site.

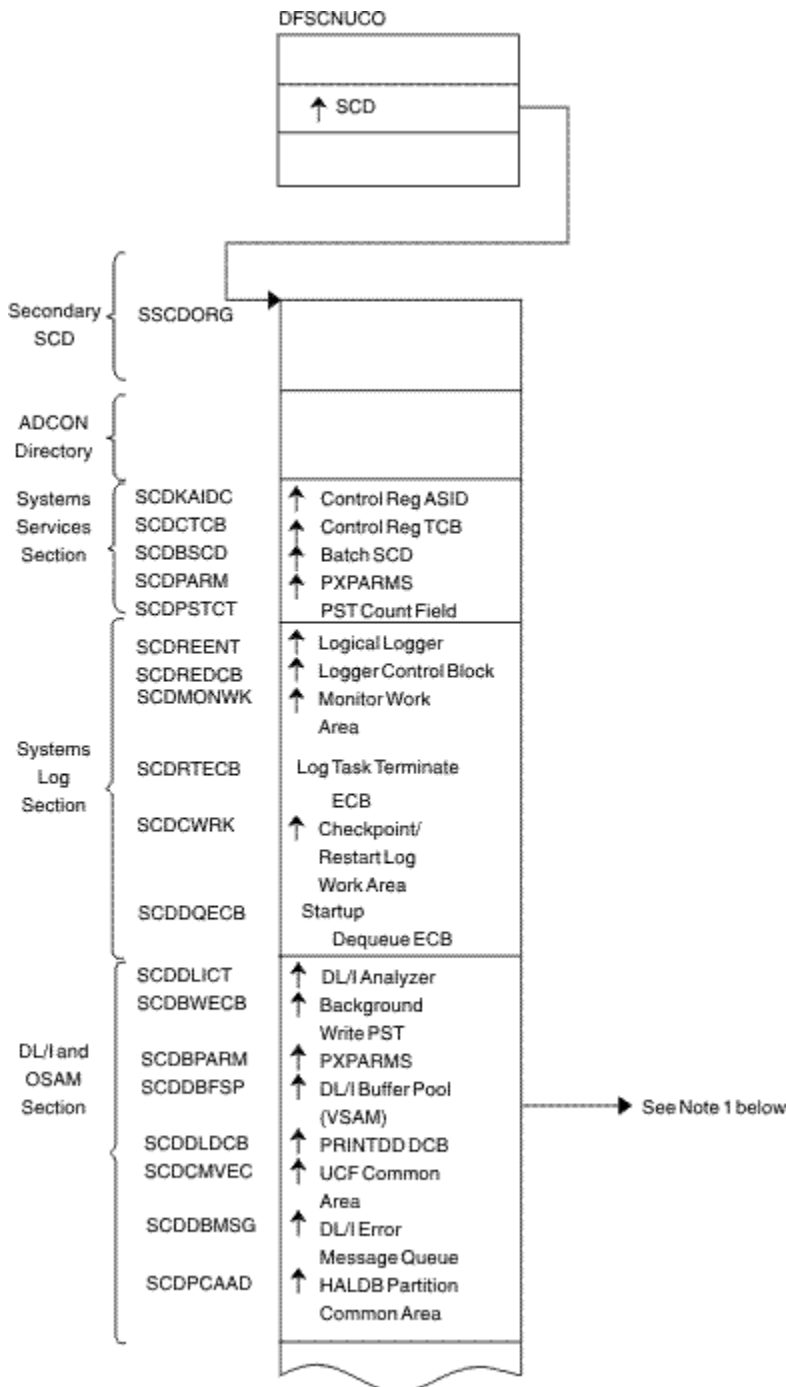
Subsections:

- [“Online system contents directory \(SCD\)” on page 87](#)
- [“DFSPRPX0–parameter blocks” on page 92](#)
- [“DL/I OSAM buffer pool” on page 93](#)
- [“Sequential buffering control blocks” on page 94](#)
- [“Buffer handler pool \(VSAM\)” on page 96](#)
- [“OSAM DECB with IOB in use” on page 97](#)
- [“OSAM IOB pool showing available IOBs” on page 97](#)
- [“Storage management control block relationships created for the MAIN pool” on page 98](#)
- [“Storage management control block relationships for preallocated storage blocks” on page 99](#)
- [“Storage management control block relationships \(DFSPOOL pools\)” on page 101](#)
- [“Storage management control block relationships \(DFSCBT00 pools\)” on page 102](#)
- [“Database Manager control blocks for a representative database” on page 103](#)
- [“Database control blocks” on page 105](#)
- [“Diagram of a Data Management Block \(DMB\)” on page 107](#)
- [“Overview of Fast Path control blocks” on page 107](#)
- [“Relationships between buffer control blocks for Fast Path databases” on page 108](#)
- [“GSAM control block overview” on page 109](#)
- [“GSAM control blocks” on page 110](#)
- [“DL/I control block relationships” on page 111](#)
- [“IMS Transaction Manager control blocks” on page 113](#)
- [“Intersystem communication control block structure” on page 113](#)
- [“VTCT load module” on page 114](#)
- [“Multiple Systems Coupling \(MSC\) control block overview” on page 116](#)
- [“Multiple Systems Coupling \(MSC\) main storage-to-main storage control block overview” on page 117](#)
- [“z/OS storage map showing IMS-to-IRLM interrelationships” on page 117](#)
- [“IRLM overall control block structure” on page 118](#)
- [“IRLM storage manager pools” on page 119](#)
- [“IRLM lock request examples” on page 120](#)
- [“Control block overview of Database Recovery Control \(DBRC\)” on page 120](#)

- “Organization and basic linkages: DOF (Device Output Format) and MOD (Message Output Descriptor)” on page 121
- “Organization and basic linkages: DIF (Device Input Format) and MID (Message Input Descriptor)” on page 122

### Online system contents directory (SCD)

The following graphics show the online system contents directory.

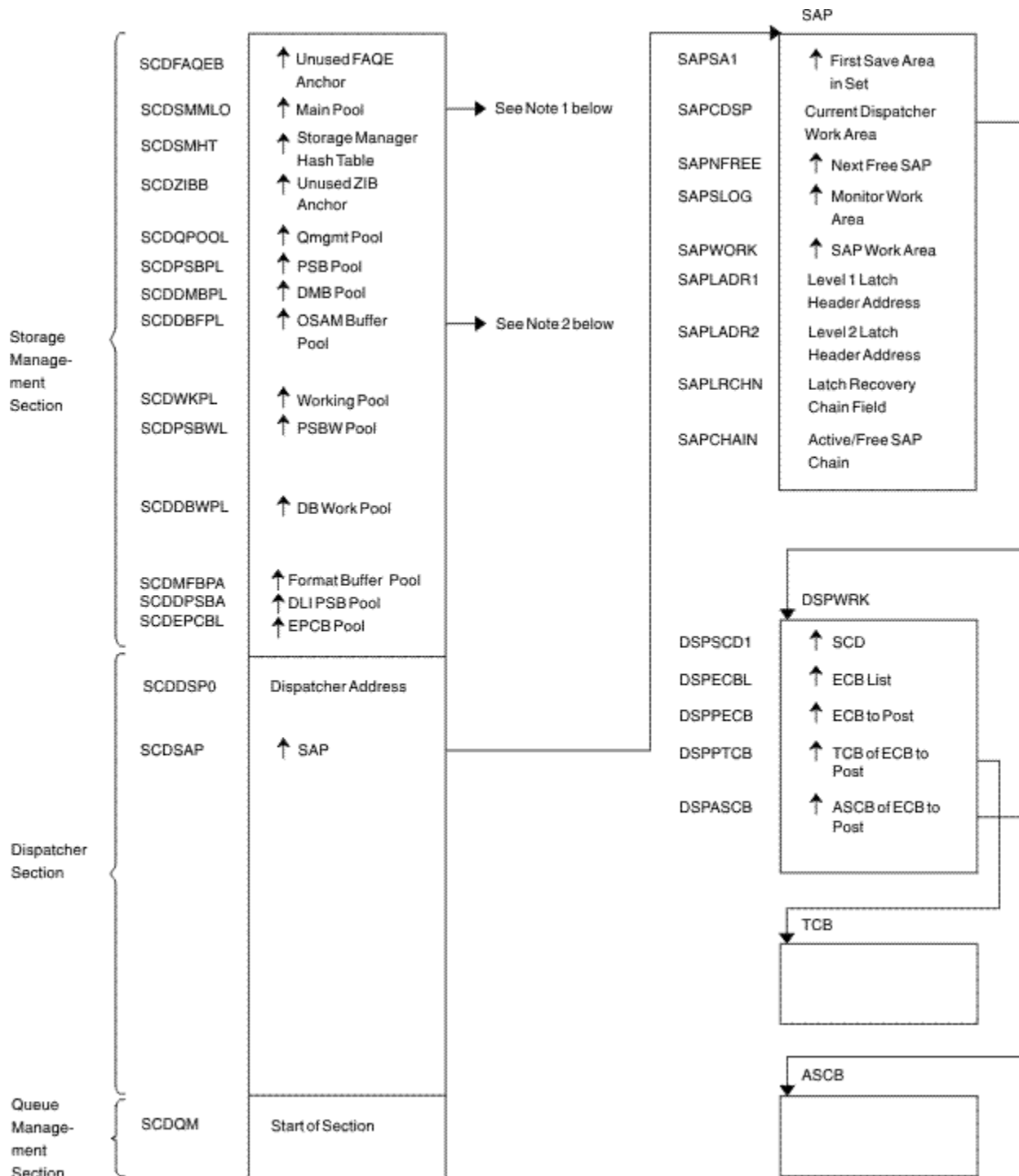


- Note 1: See Figure 11 on page 94 and Figure 13 on page 96.

Figure 4. Online system contents directory (SCD) Part 1 of 6

|                                       |          |                                          |
|---------------------------------------|----------|------------------------------------------|
| Sequential Buffering Section          | SCDSBPTR | ▲ SB SCD                                 |
| Data Sharing Section                  | SCDIRPM  | ▲ IRLM Parms                             |
|                                       | SCDRDSH0 | ▲ DFSRDSH0 (ASYNCR Data Sharing Routine) |
| Common Services Section               | SCDPCCC0 | ▲ DFSPCCC0 (IRLM/DBRC Handler)           |
|                                       | SCDQHRS  | ▲ Queue Header Table Address             |
|                                       | SCDCIR00 | ▲ Create ITASK Module                    |
| STAE/ESTAE Section                    | SCDFMOD0 | ▲ Entry Point of Attach ITASK            |
|                                       | SCDXSTA0 | A(ESTAE)                                 |
| Latch/Lock Section                    | SCDLRSAP | ▲ Latch Recovery ITASK SAP               |
|                                       | SCDLMGRA | ▲ Latch Manager Address                  |
| Formatted Dump Section                | SCDDSDWA | ▲ SDWA at Dump Time                      |
| Timer Services Section                | SCDCKVAL | Clock Value                              |
|                                       | SCDTIMEP | ▲ Timer Services Module (DFSFTIM0)       |
| Trace Services Section                | SCDTRBLK | ▲ Trace Control Block                    |
|                                       | SCDPITME | PITRACE Buffer                           |
| External Subsystem Section            | SCDESETP | ▲ ESET Prefix                            |
| Dynamic Control Block Builder Section | SCDCBTA  | ▲ Control Block Extension Address        |
|                                       | SCDBC00  | ▲ Address of Control Block Build         |

Figure 5. Online system contents directory (SCD) Part 2 of 6



- Note 1: See [Figure 16 on page 99](#).
- Note 2: See [Figure 11 on page 94](#).

Figure 6. Online system contents directory (SCD) Part 3 of 6

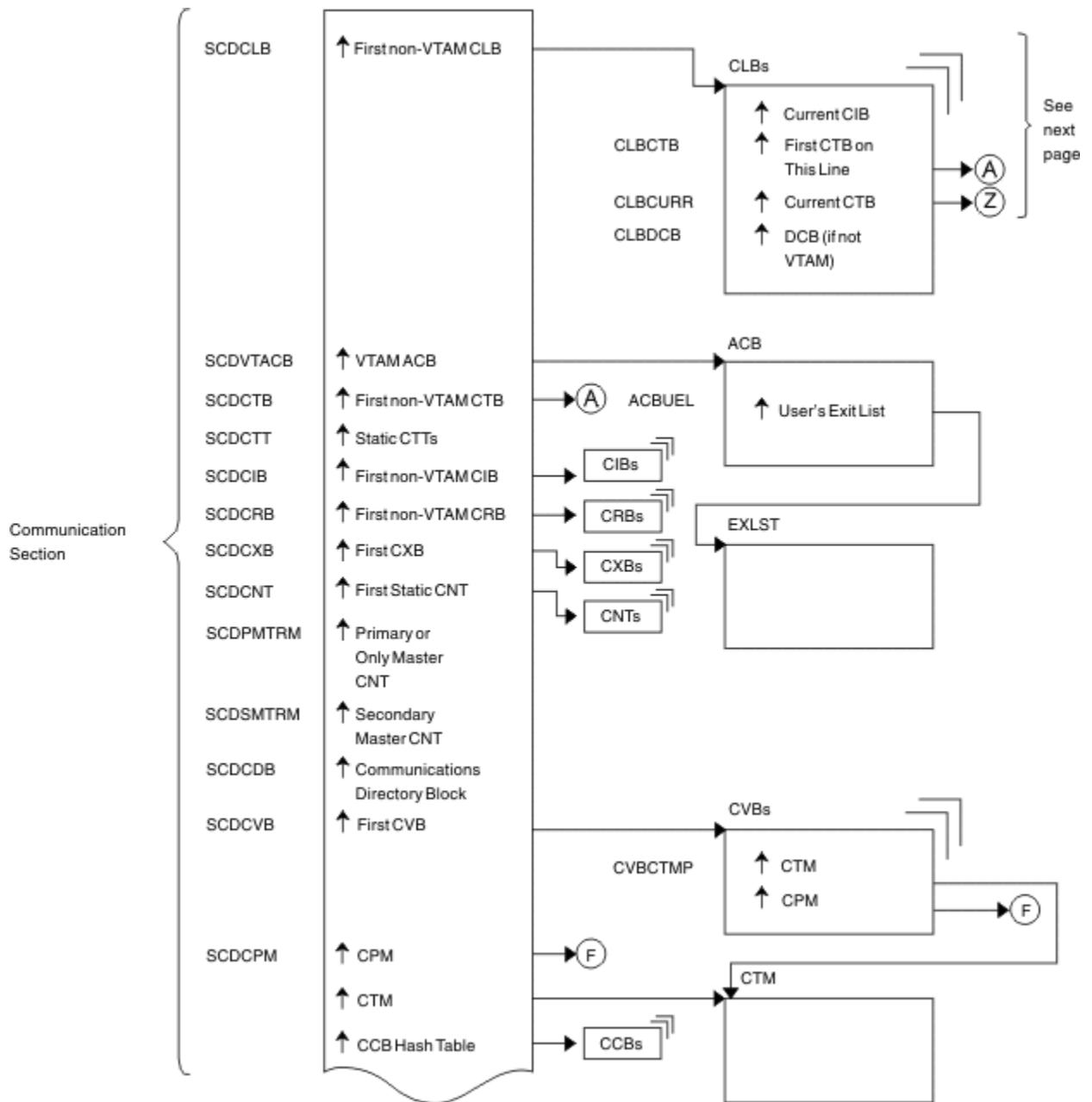


Figure 7. Online system contents directory (SCD) Part 4 of 6



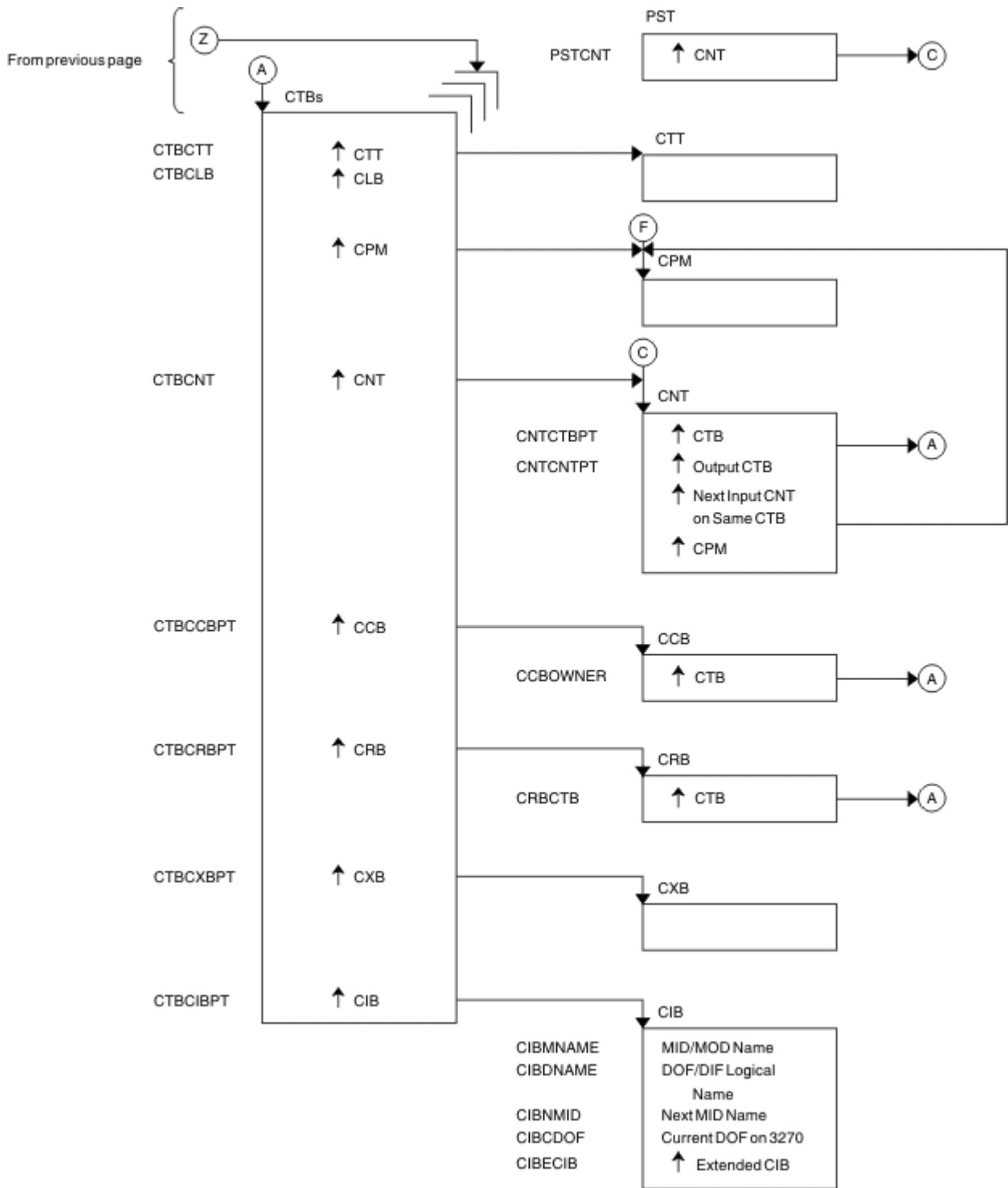


Figure 8. Online system contents directory (SCD) Part 5 of 6

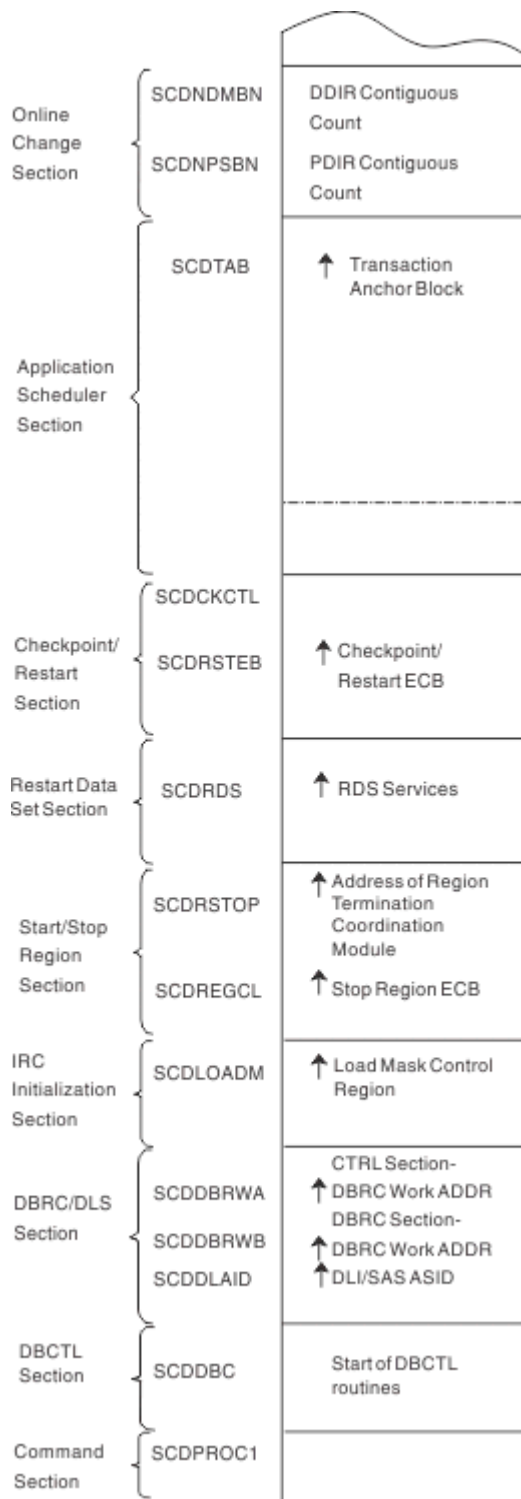
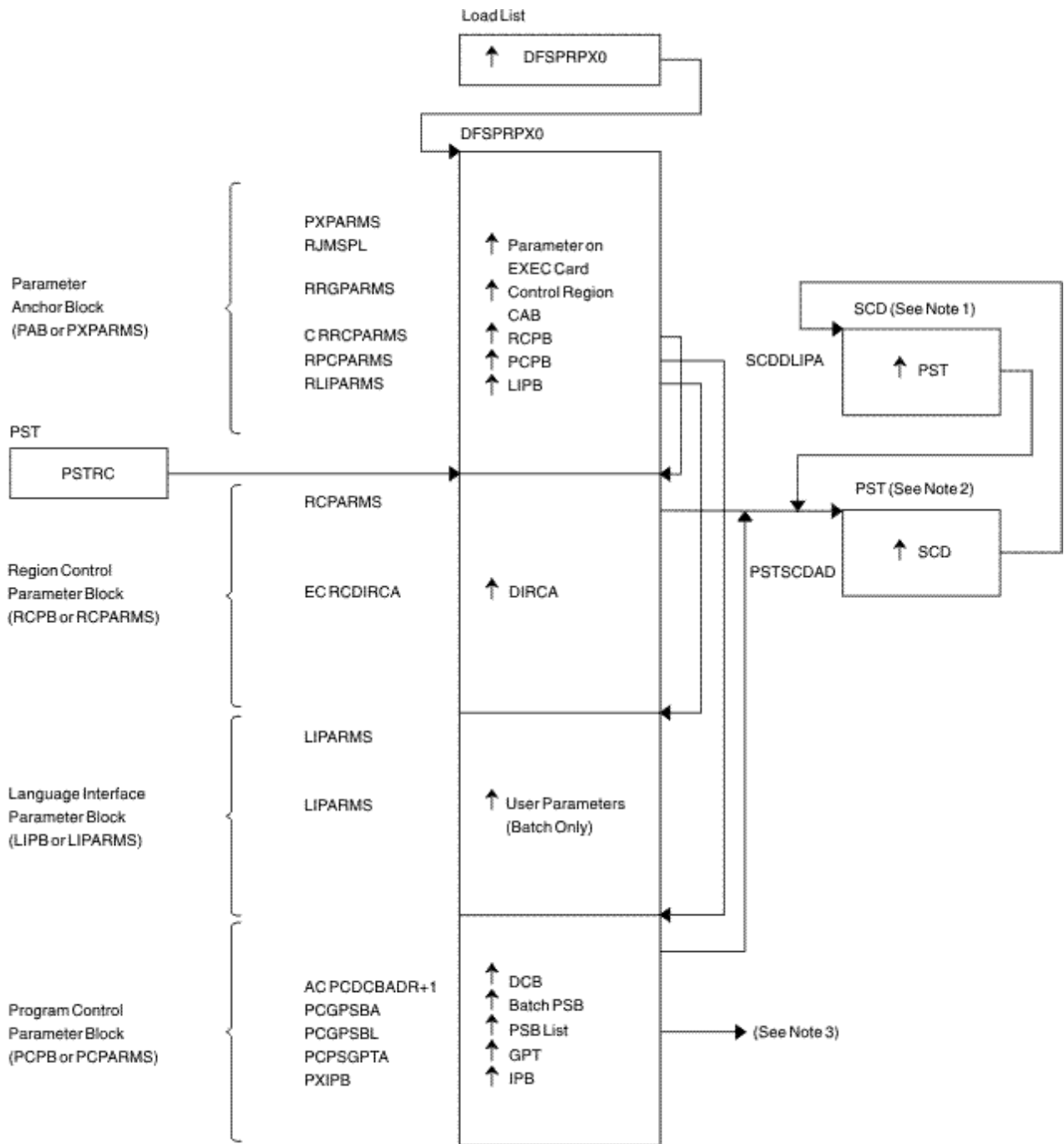


Figure 9. Online system contents directory (SCD) Part 6 of 6

### DFSPRPX0-parameter blocks

The following figure shows the parameter blocks for DFSPRPX0.



- Note 1: See [Figure 4](#) on page 87
- Note 2: See [Figure 21](#) on page 105
- Note 3: See [Figure 26](#) on page 110

Figure 10. DFSPRPX0-parameter blocks

### DL/I OSAM buffer pool

The following figure shows the control blocks for DL/I OSAM buffer pool.

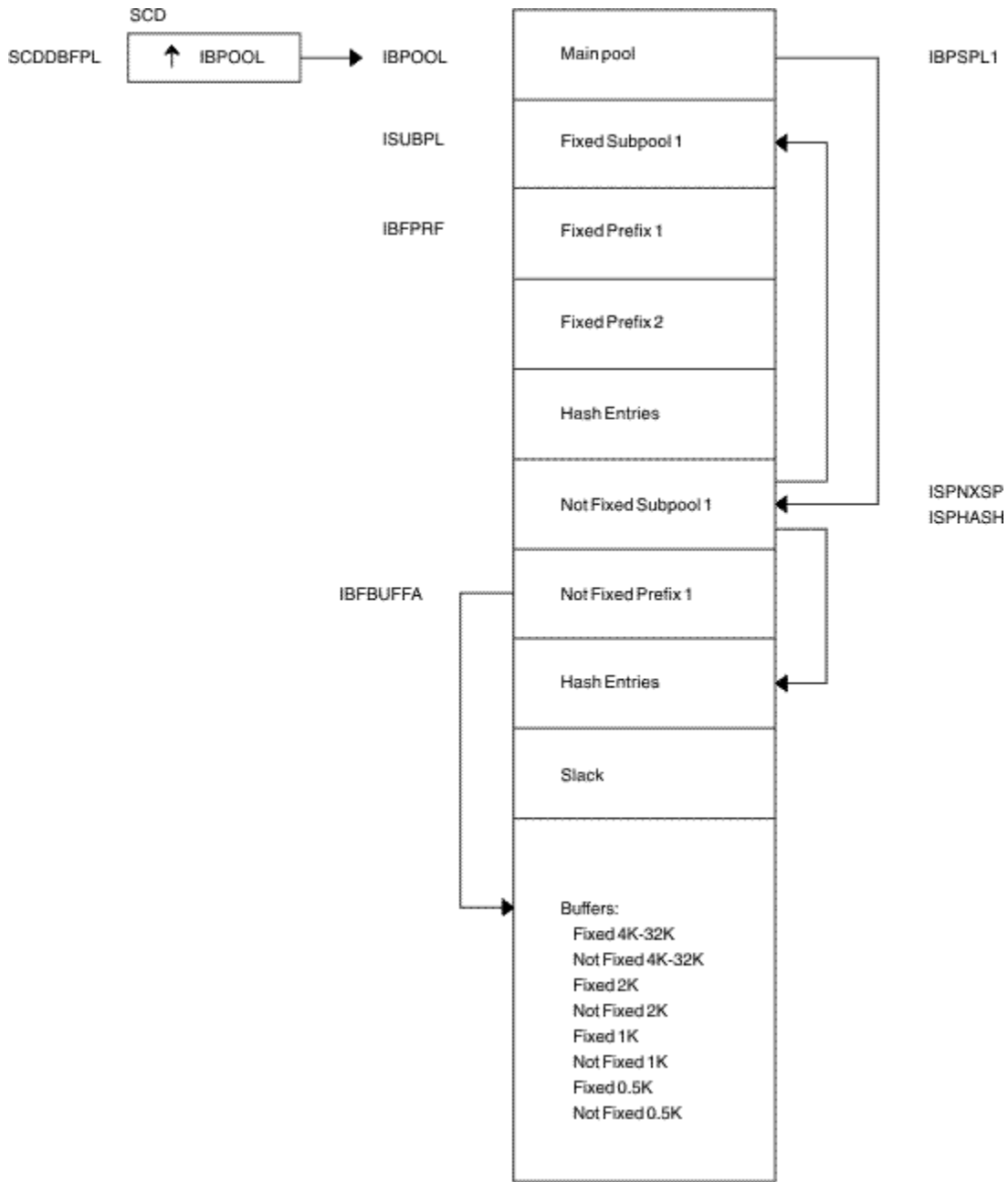


Figure 11. DL/I OSAM buffer pool

### Sequential buffering control blocks

The following figure shows the sequential buffering control blocks.

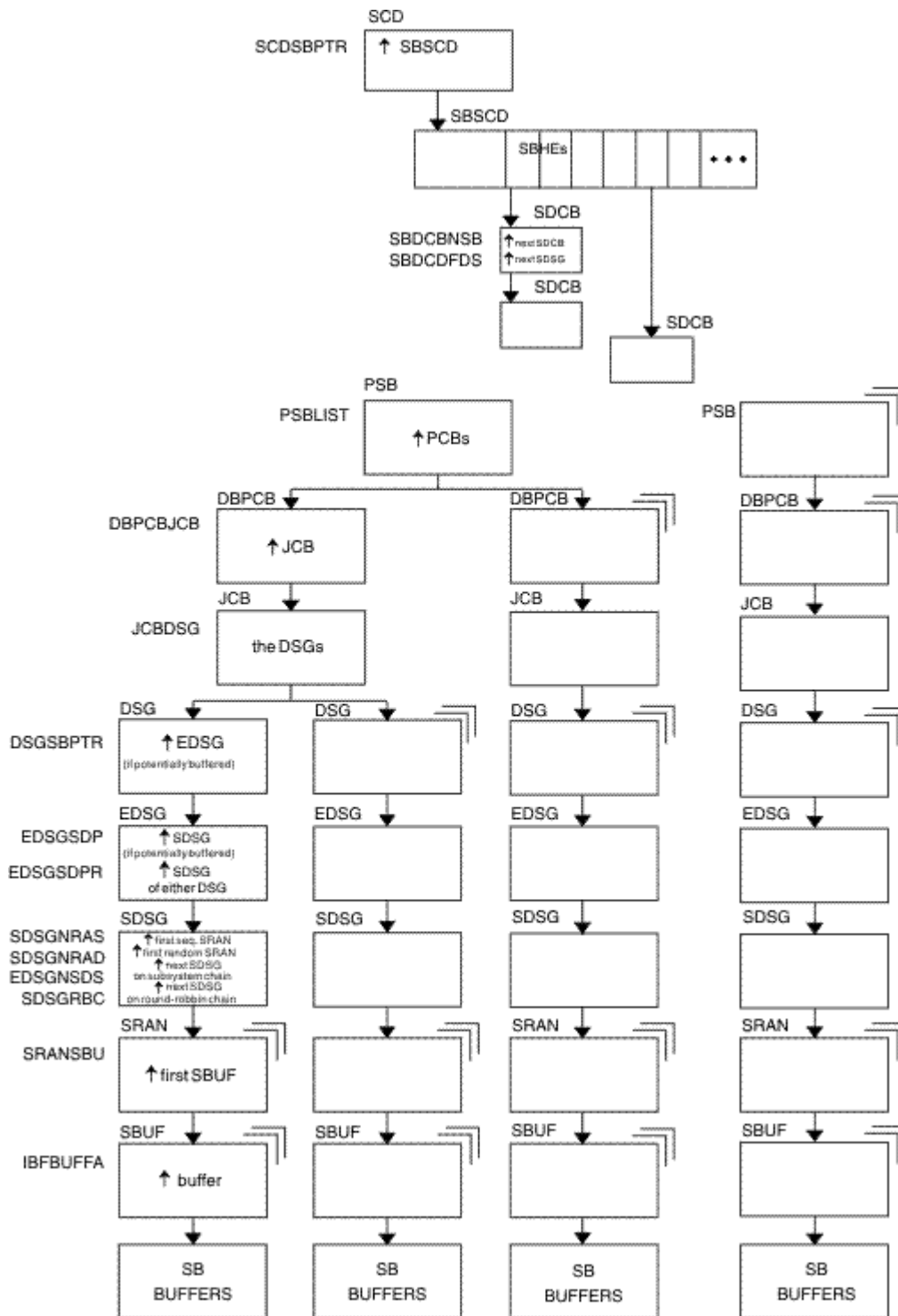


Figure 12. Sequential buffering control blocks

**Notes to Figure 12 on page 95:**

1. SCD is the IMS systems content directory.
2. SBSCD is a sequential buffering extension to the SCD.
3. SBHEs are sequential buffering hash entries located within the SBSCD (sequential buffering extension to the systems content directory). IMS uses SBHEs to:
  - Anchor the sequential buffering extension to the DCB (SDCB)

- Serialize the SDCB and SDSG subsystem chains (defined in notes “4” on page 96 and “8” on page 96).
4. SDCB is a sequential buffering extension to the data communication block. There is one SDCB for each data set that is actively being sequentially buffered. There must be a separate SDCB for each SBPST that references a HALDB partition, because information in the SDSG will change as the DL/I calls go from partition to partition. As a result, multiple SBPSTs cannot share an SDCB, as is possible for non-HALDB databases. For HALDB, there is one SDCB for each partition used by a PST. IMS uses each SDCB to anchor any sequential buffering SDSGs that have buffer pools allocated to them.
  5. The chains of SDCBs and SDSGs anchored in the SBHEs are called the SDCB and SDSG subsystem chains.
  6. The program specification blocks, DBPCBs, job control blocks, and the data set group control blocks in the figure are DL/I control blocks.
  7. EDSG is a sequential buffering extension to the DSG. The field EDSGSDP points to the SDSG if the data set group control block is potentially buffered by SB. If the DSG is not potentially buffered (but another DSG for the same data set and same application is), then the field EDSGSDPR points to one of the SDSGs of these "other" DSGs.
  8. SDSG is a sequential buffering extension to the data set group control block. The SDSG is present if the user wants to have the DSG sequentially buffered. The SDSG is the control block that controls one sequential buffering buffer pool.
  9. SRAN is a sequential buffering control block that describes references in one set of recently referenced consecutive data set blocks.
  10. SBUF is a sequential buffering control block that describes one individual buffer.

### Buffer handler pool (VSAM)

The following figure shows the buffer handler pool (VSAM).

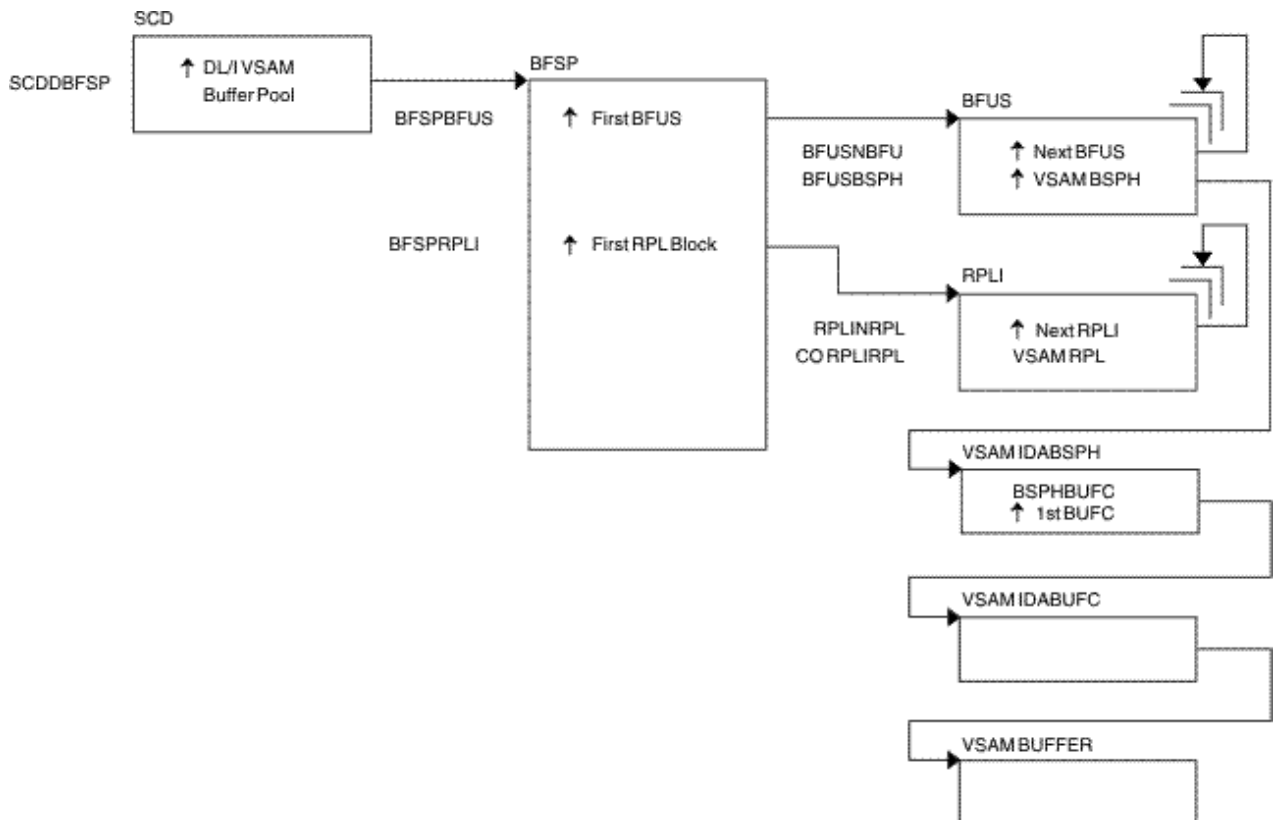


Figure 13. Buffer handler pool (VSAM)

### OSAM DECB with IOB in use

The following figure shows the OSAM DECB with IOB in use.

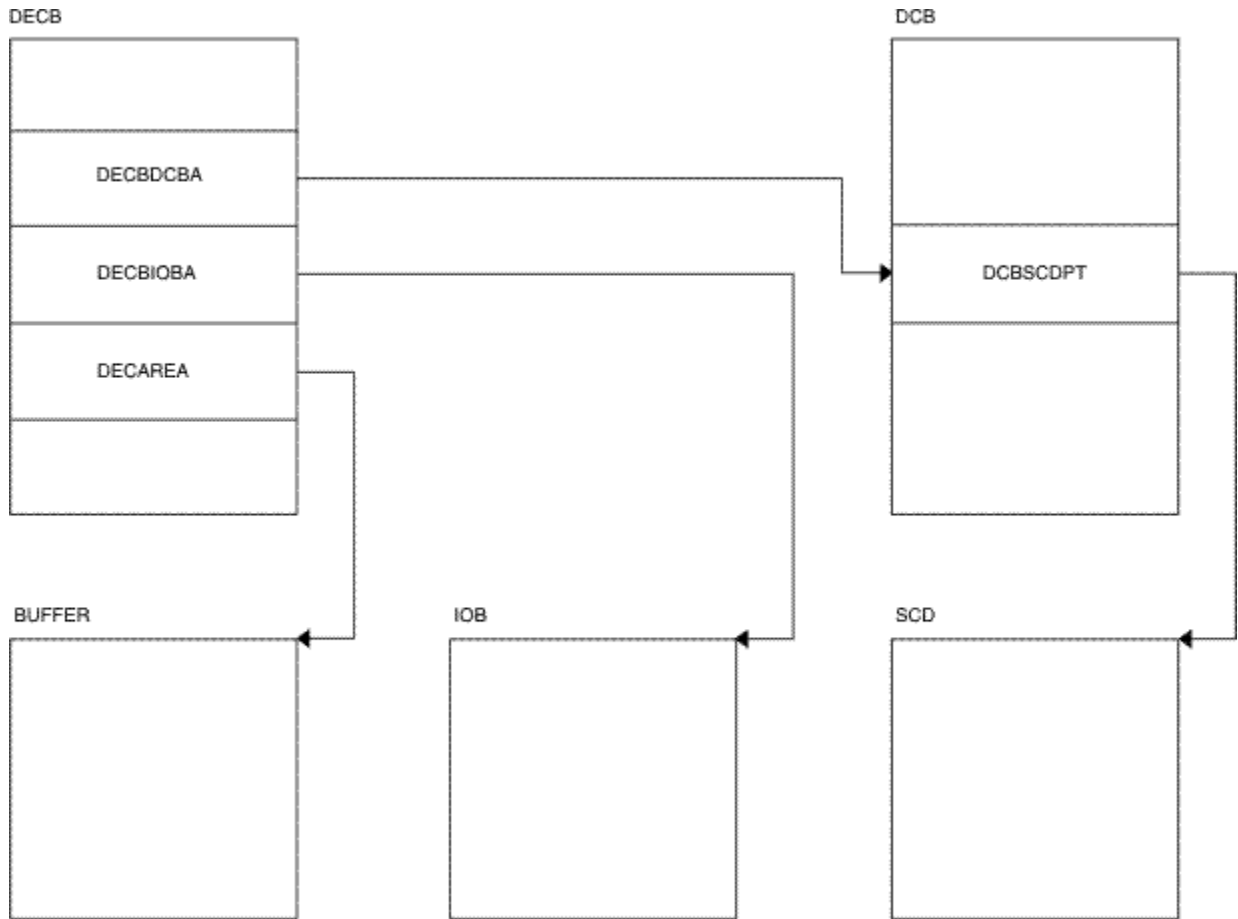


Figure 14. OSAM DECB with IOB in use

### OSAM IOB pool showing available IOBs

The following figure shows OSAM IOB pool showing available IOBs.

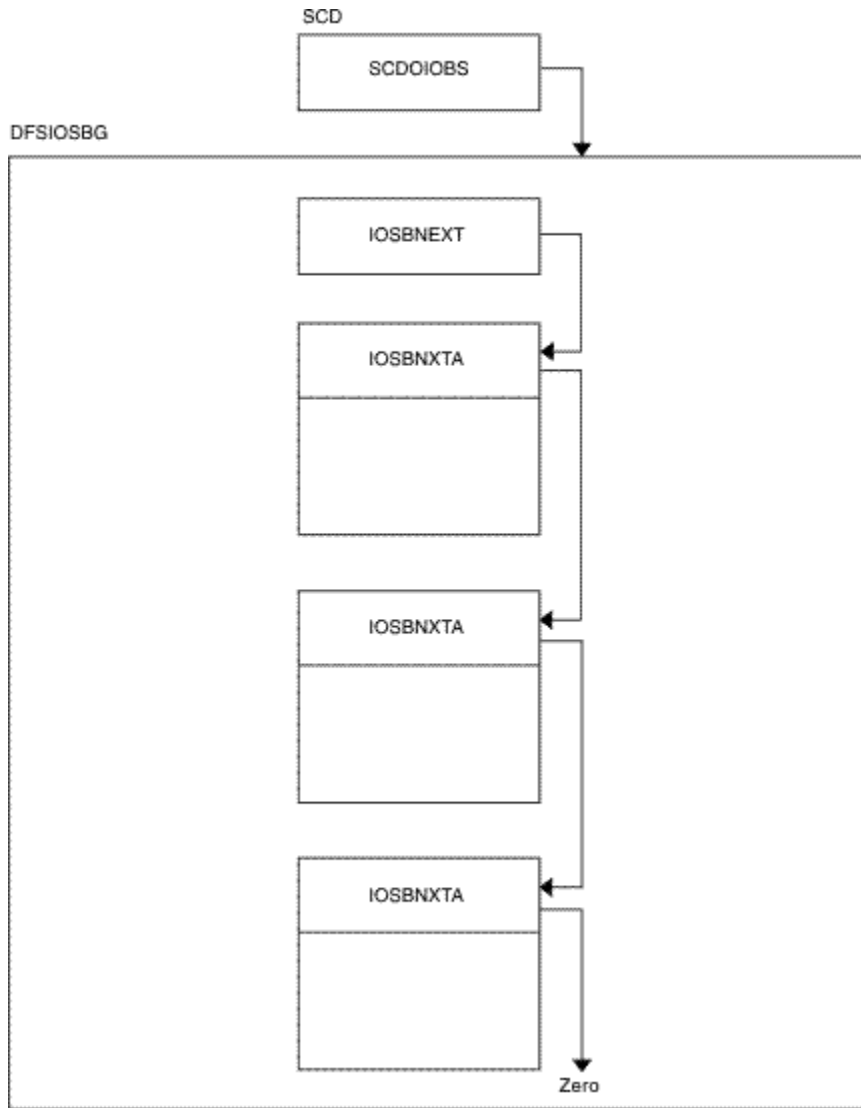


Figure 15. OSAM IOB pool showing available IOBs

Storage allocated using the ICREATE/IDESTROY macros is obtained from the MAIN (WKAP) pool. The control block relationship for the MAIN pool is shown in [Figure 16 on page 99](#).

**Storage management control block relationships created for the MAIN pool**

The following figure shows storage management control block relationships created for the MAIN pool.



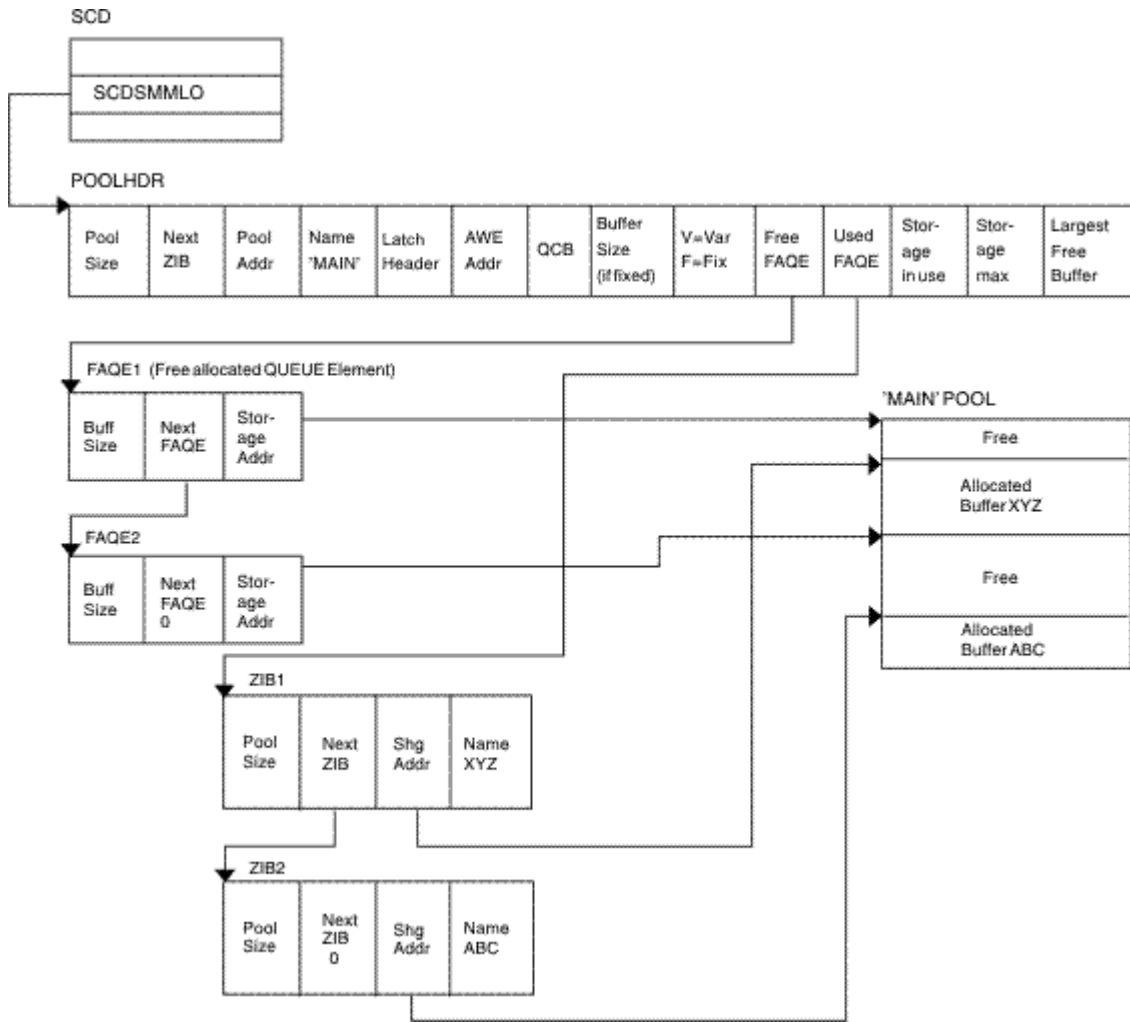


Figure 16. Storage management control block relationships created for the MAIN pool

### Storage management control block relationships for preallocated storage blocks

The following diagram shows the control block relationships for those pools managed by the DFSISMNO Storage Manager.

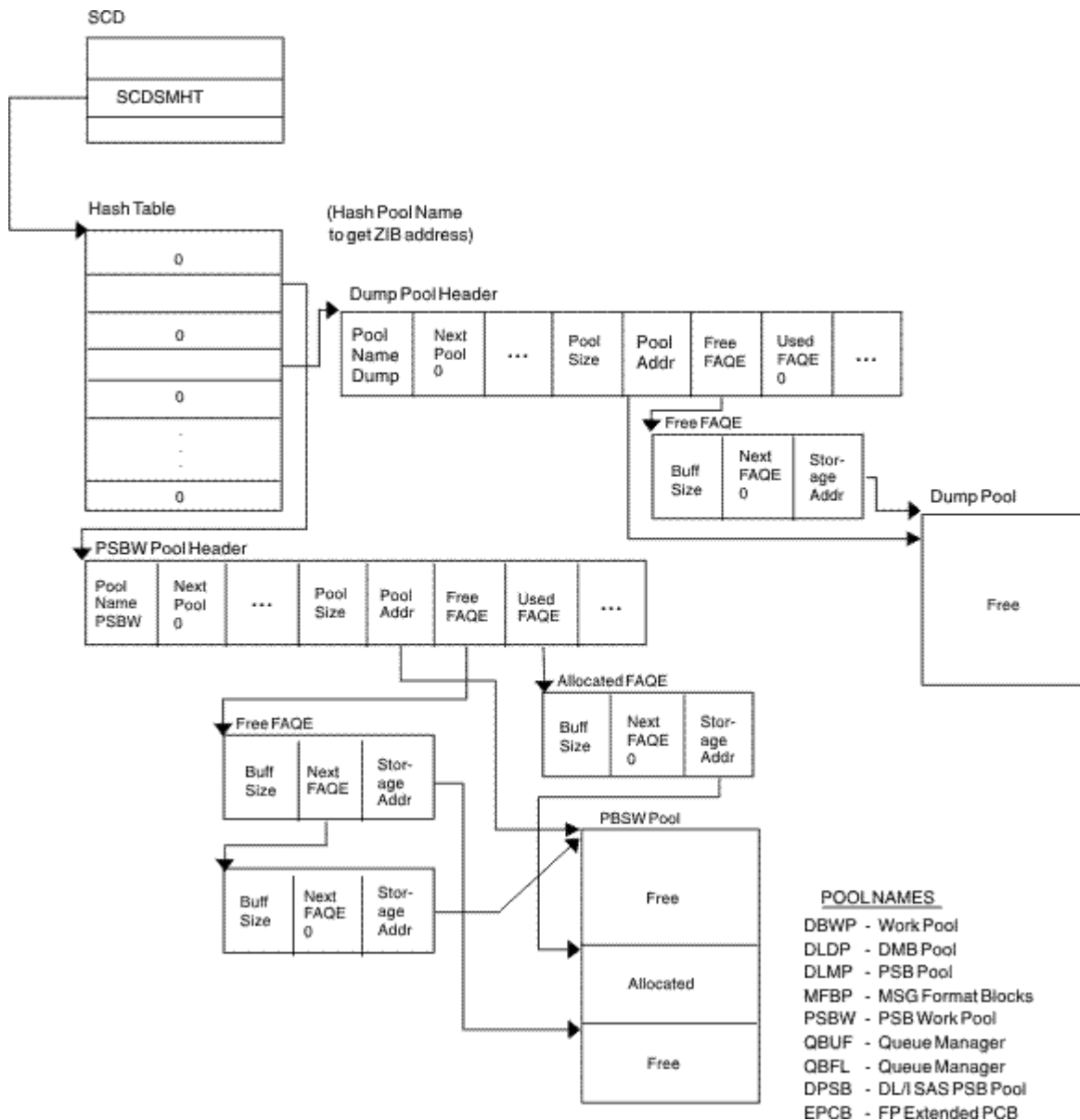


Figure 17. Storage management control block relationships for preallocated storage blocks

Figure 18 on page 102 shows the control block relationship for pools managed by the DFSPPOOL Storage Manager. Each pool consists of zero or more noncontiguous storage blocks anchored off a pool header. By obtaining new blocks and releasing unused blocks, you can expand and contract a pool as needed during the execution of IMS.

Each block is divided into a number of fixed-length buffers that are used to satisfy storage requirements. The size and number of buffers can vary from block to block within a pool. Each block also has a block header which contains various information on the block

Each pool can be allocated with a maximum of thirty-two different buffer sizes. The pool header contains a noncompressible block pointer and a compressible block chain anchor for each buffer size available.

The pool header also contains an oversized block chain anchor. If the request size is larger than the largest buffer size available, a block is obtained containing a single buffer of the requested size. Blocks obtained in this manner are placed on the oversized chain. The intention of the oversized chain is to allow for exceptional requests, since normal processing should not need any oversized buffers.

The first block allocated for each buffer size is referred to as the primary block. The number of buffers contained within the primary block can vary from any secondary blocks of the same buffer size. If the primary block is obtained when the pool is allocated, it is held until IMS termination. Because it cannot be

compressed, serialization logic is not required when allocating or releasing a buffer from one of these blocks.

If the primary block is not obtained until the first GET request, it along with any secondary blocks are placed on the compressible block chain anchored off the pool header. Serialization logic must be used when scanning the blocks on the compressible chains.

An 8-byte prefix and an 8-byte suffix is added to each buffer. The prefix and suffix are used by the Storage Manager exclusively. The size of the prefix and suffix is included in the current pool size.

The buffer size used to satisfy an incoming request is determined on a best fit basis. Unless the size of the buffer requested is the same size as the actual buffer, there is some unused storage between what the caller views as the end of the buffer and the actual end of the buffer. The buffer the user receives appears to be of the size requested. Any unused space is transparent.

The following pools are defined with user overlay detection: AOIP, CIOP, CMDP, DYNP, EMHB, HIOP, LUMC, LUMP, and SPAP. If a pool is defined with user overlay detection, an 8-byte constant is added to the user portion of the buffer. As far as the caller is concerned, the length of the buffer received is the length requested, followed by an 8-byte constant. For example, if a caller requests a 100-byte buffer from a pool with a user overlay detection, and the smallest buffer size available to satisfy the request is 128 bytes, the user overlay detection constant is placed at an offset of 100 bytes into the buffer. Bytes 107 through 127 are unused.

The user overlay detection constant is used by IMS modules. The Storage Manager does not look at the user overlay detection constant.

### **Storage management control block relationships (DFSPool pools)**

The following figure shows storage management control block relationships (DFSPool pools).

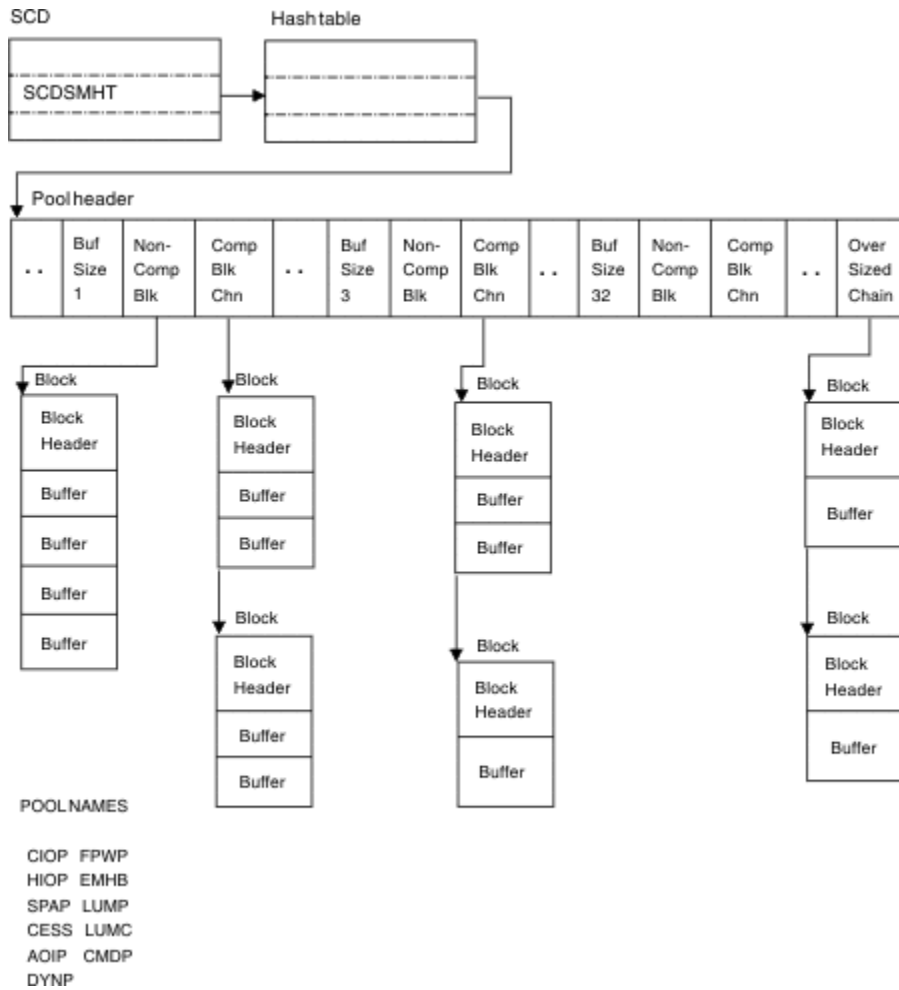


Figure 18. Storage management control block relationships (DFSPool pools)

**Storage management control block relationships (DFSCBT00 pools)**

The following figure shows the Storage Management (DFSCBT00 Pools) control blocks relationships.

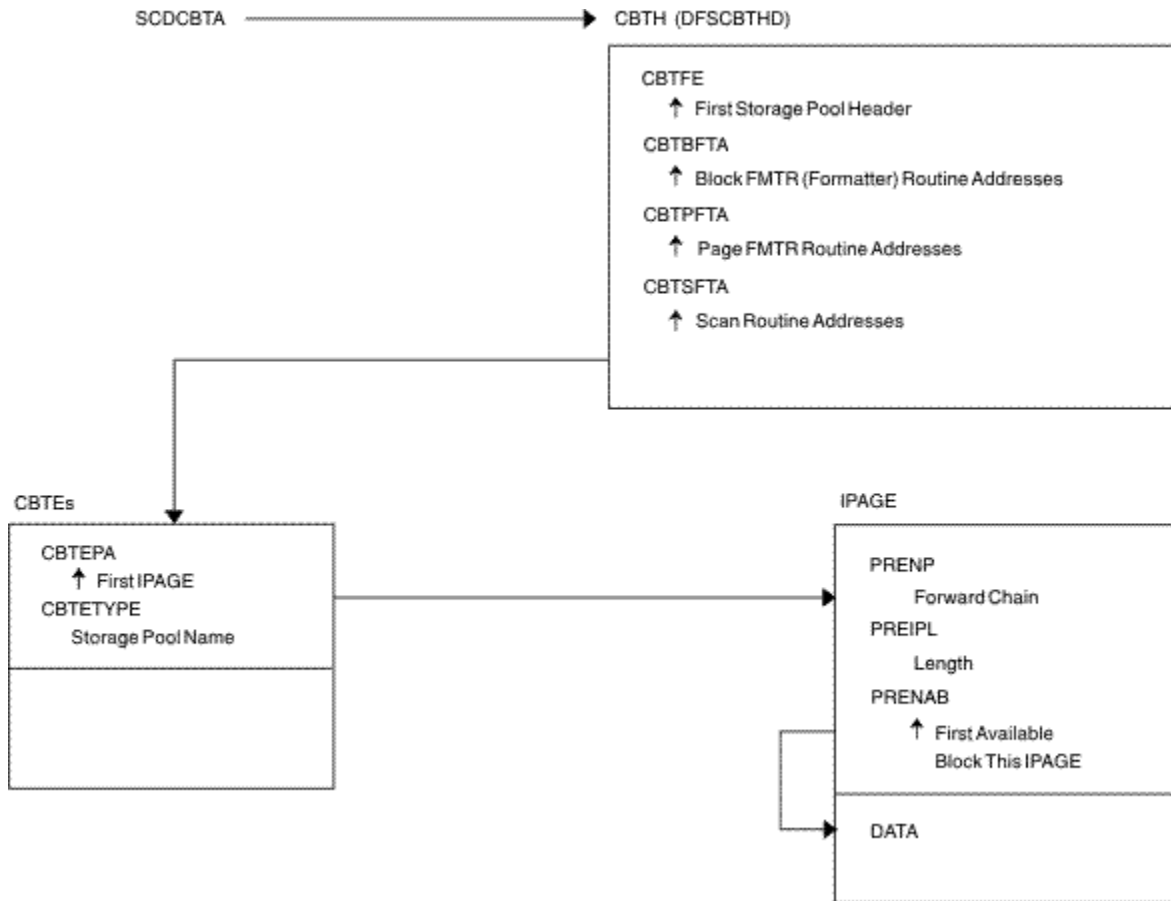


Figure 19. Storage management control block relationships (DFSCBT00 pools)

### Database Manager control blocks for a representative database

The following figure shows the Database Manager control blocks for a representative database.

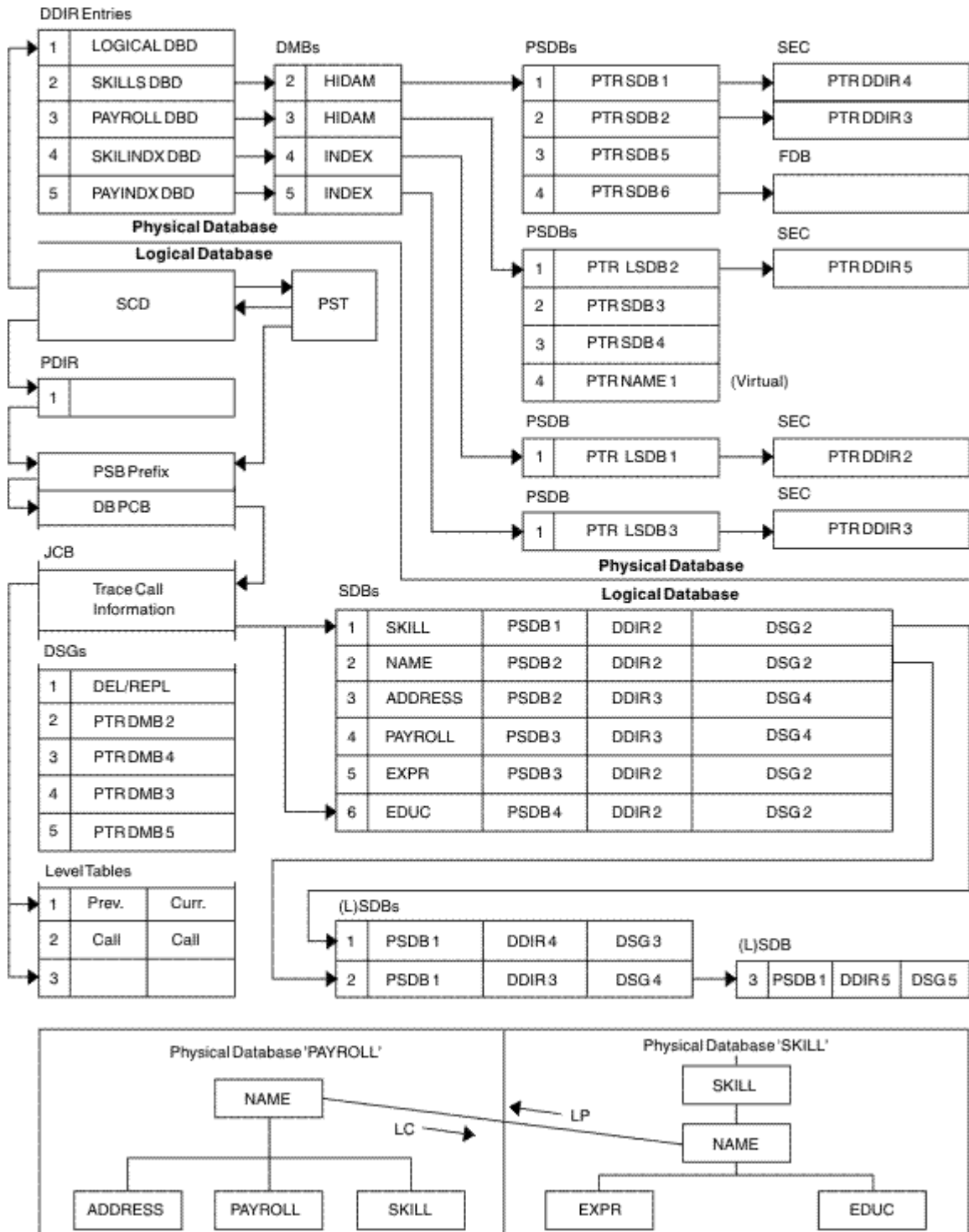


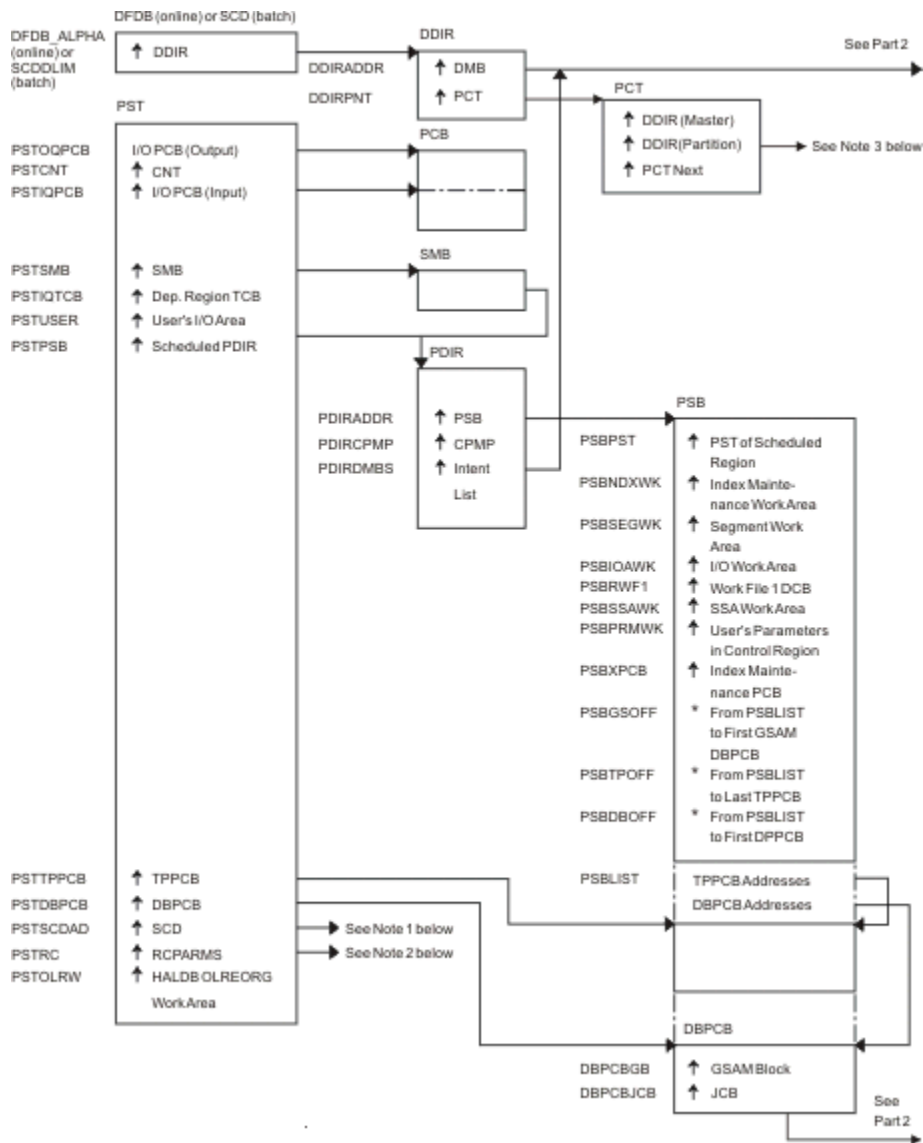
Figure 20. Database Manager control blocks for a representative database

**Note the following HALDB differences for Figure 20 on page 104:**

- The SDBs pointer to the DDIR always points to the HALDB Master's DDIR.
- The PSDBs are under the HALDB master DMB in the DMB pool. The partition DMBs do not contain PSDBs.
- There is no separately defined DDIR or DMB for the primary INDEX database of a PHIDAM. Instead there is an additional AMP in the partition DMB for the primary index.
- There is an ILE DSG for the ILDS which follows the Delete/Replace DSG.

## Database control blocks

The following figure shows the relationships between database control blocks.



See the notes that follow Figure 21 on page 105.

Figure 21. Database control blocks: Part 1 of 2

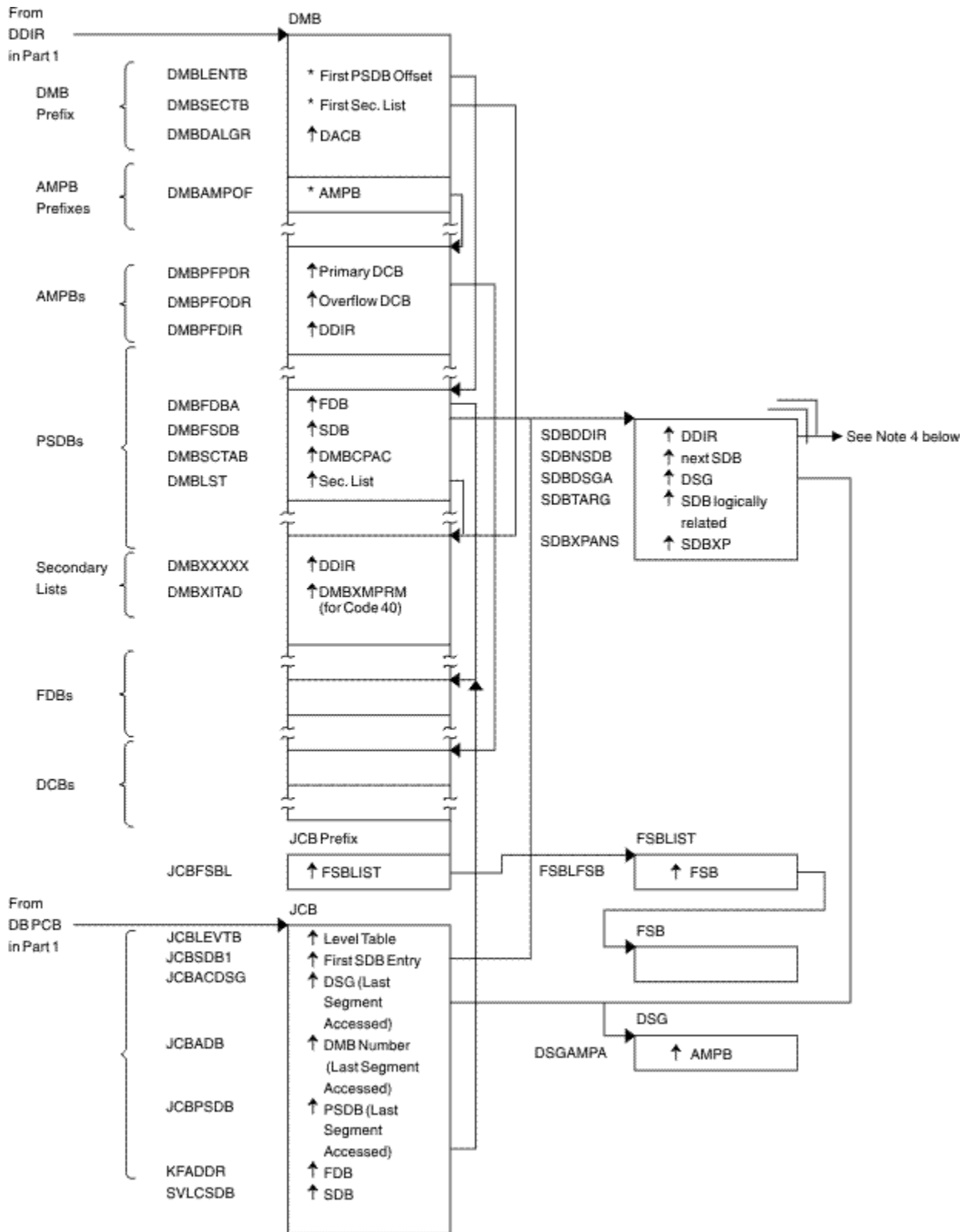


Figure 22. Database control blocks: Part 2 of 2

**Notes to Figure 21 on page 105:**

1. See Figure 4 on page 87.
2. See Figure 10 on page 93.



3. This is a unique HALDB control block. This control block points the partition DDIR to each other and points the partition DDIR to the master DDIR.
4. For HALDB, the SDB points to the Master DDIR.

### Diagram of a Data Management Block (DMB)

The following figure shows a diagram of a Data Management Block (DMB).

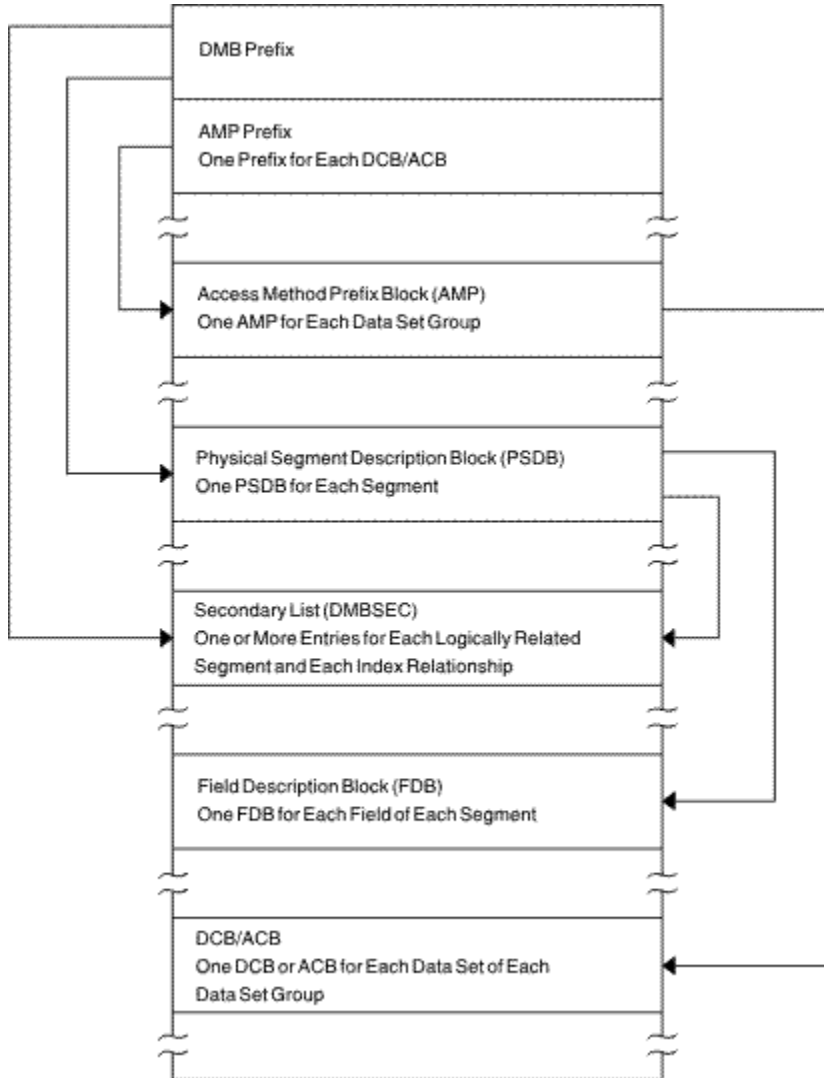


Figure 23. Diagram of a Data Management Block (DMB)

**Note to Figure 23 on page 107:** For a HALDB, dual DMBs exist in storage. When HALDB Online Reorganization is not in progress, one DMB is active and the other inactive. When HALDB Online Reorganization is in progress, both DMBs are active, with one DMB representing the input data sets, and one DMB representing the output data sets.

### Overview of Fast Path control blocks

The following figure shows an overview of Fast Path Control Blocks.

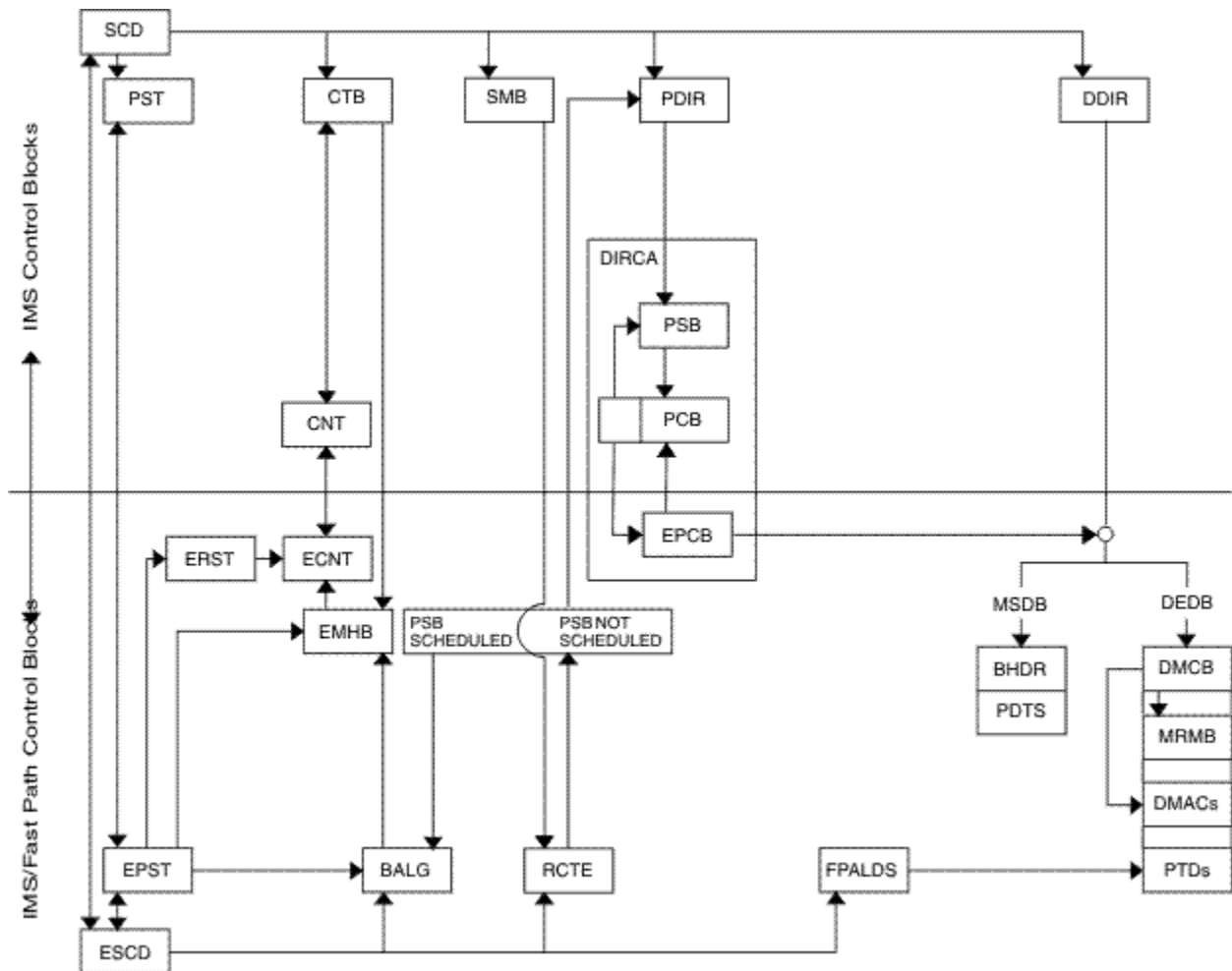
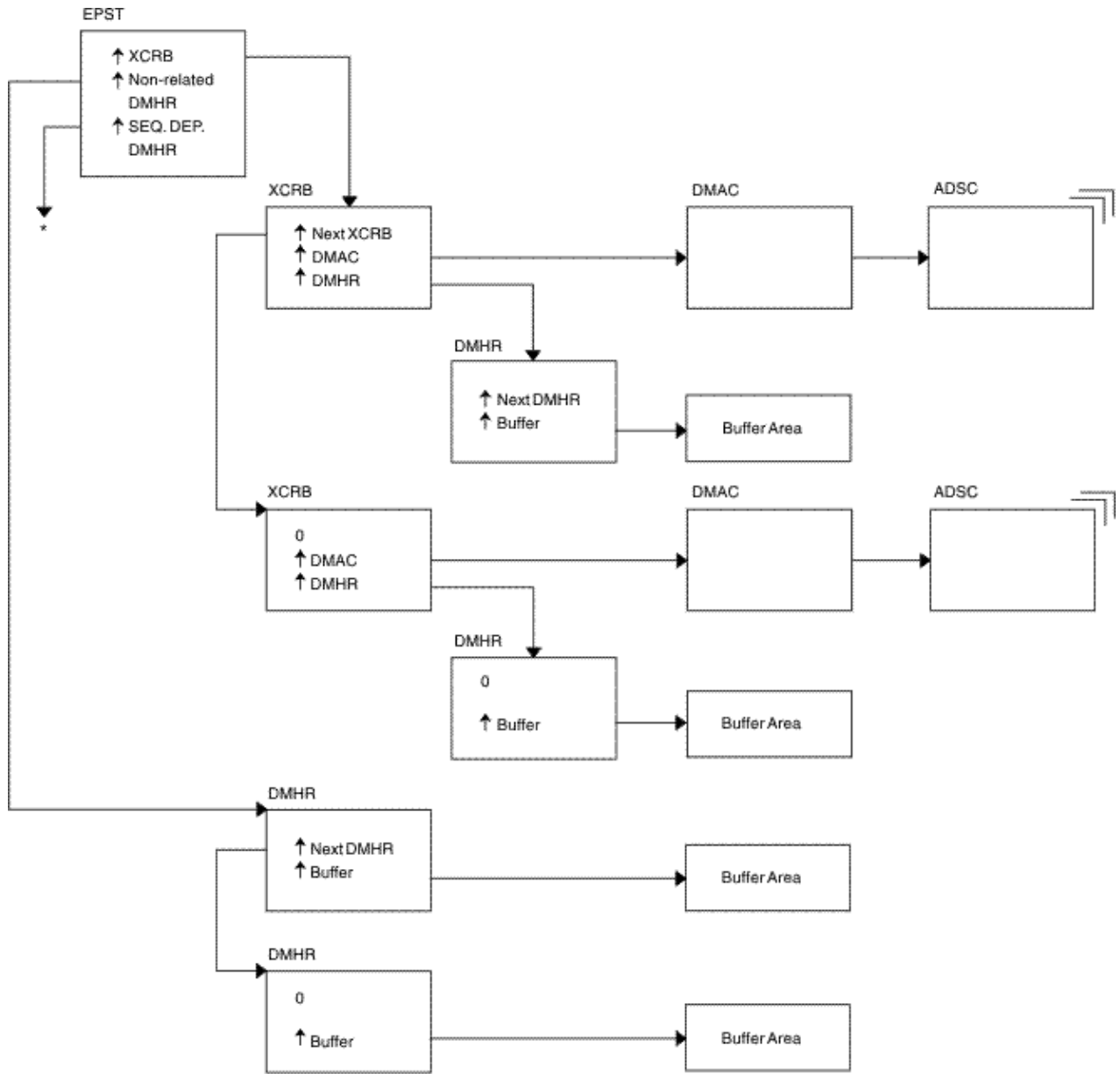


Figure 24. Overview of Fast Path control blocks

### Relationships between buffer control blocks for Fast Path databases

The following figure shows the relationships between buffer control blocks for Fast Path databases.



\* EPSTSDBH (This chain is identical to non-related DMHR chain.)

Figure 25. Relationships between buffer control blocks for Fast Path databases

### GSAM control block overview

The following figure shows a GSAM control block overview.

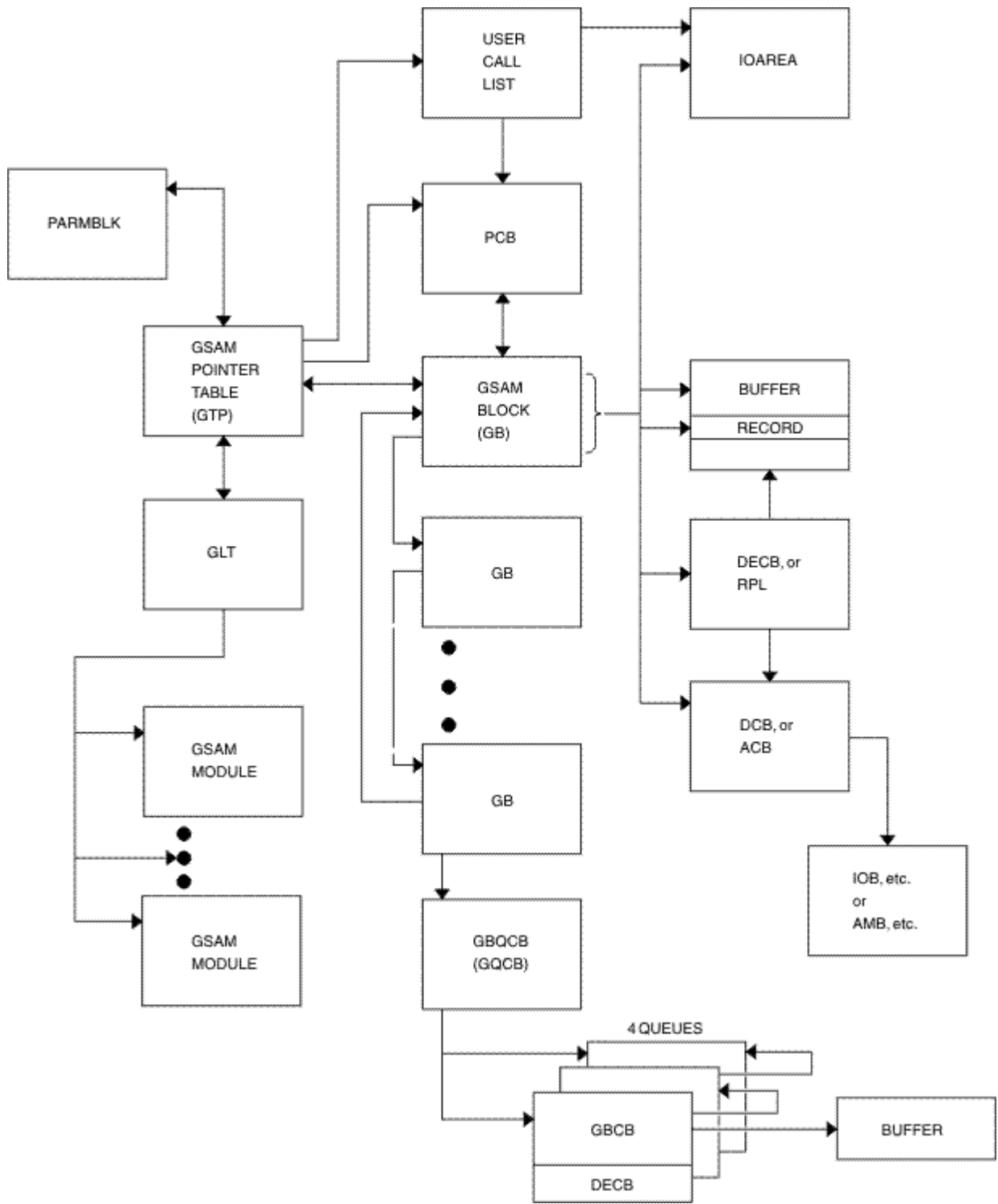


Figure 26. GSAM control block overview

**GSAM control blocks**

The following figure shows the GSAM control blocks.

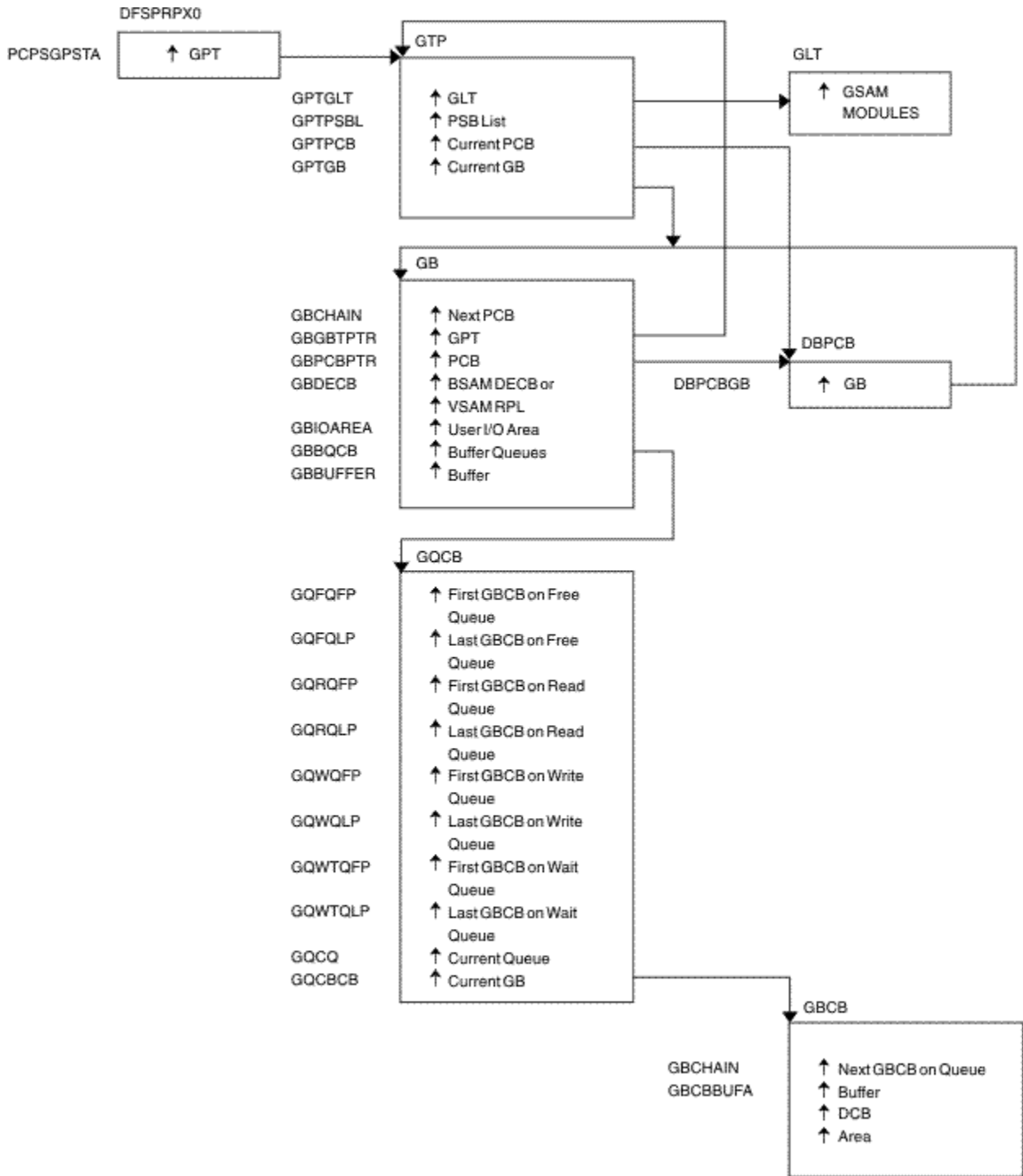


Figure 27. GSAM control blocks

### DL/I control block relationships

The following figure shows the DL/I control block relationships.

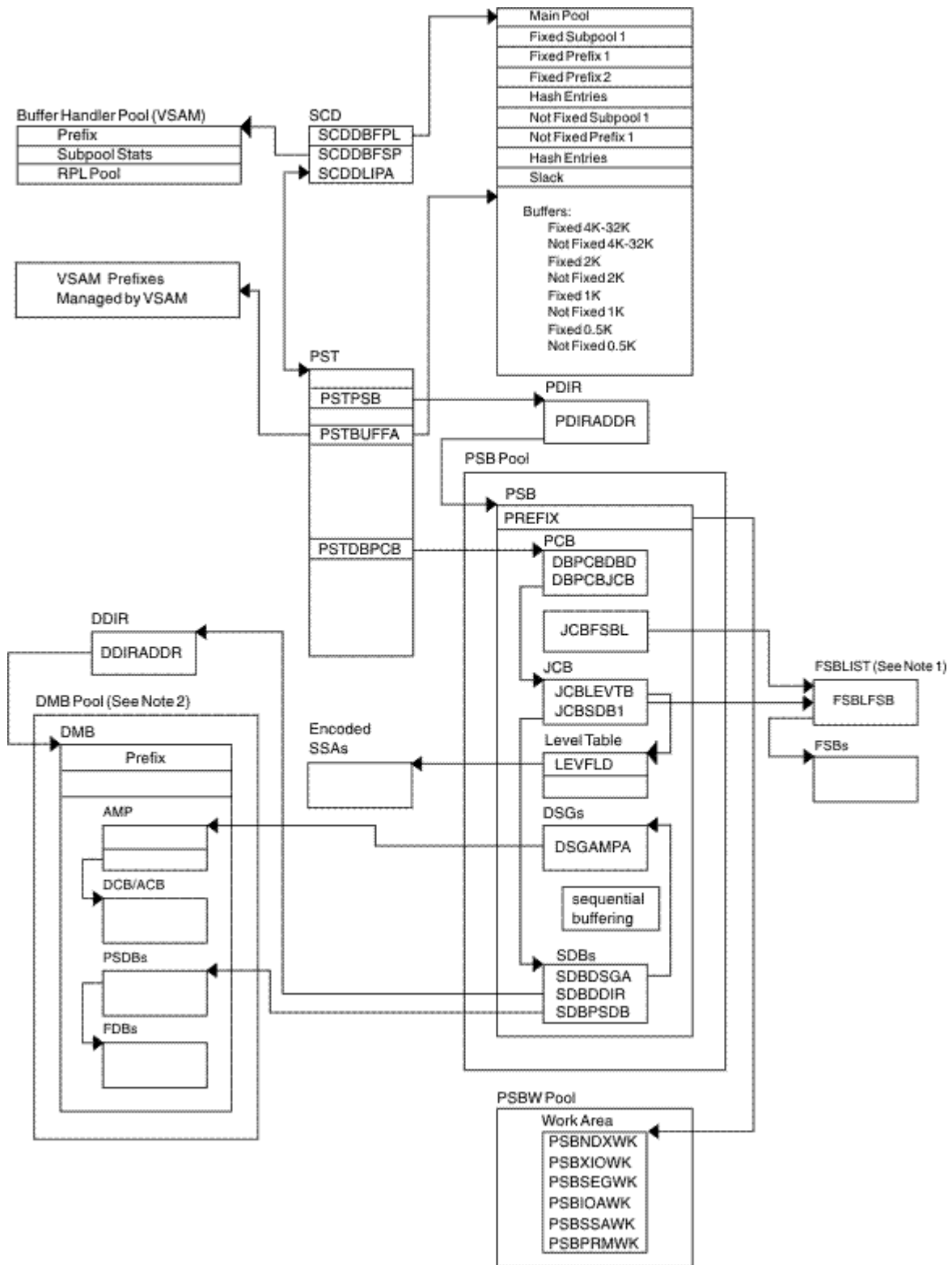


Figure 28. DL/I control block relationships

**Notes to Figure 28 on page 112:**

1. The FSBLIST contains pointers to the Field Sensitivity Block (FSB). The FSB describes this user's logical use of the sensitive field.
2. A partition HALDB DMB is not in the DMB pool. For HALDB, only the Master DMB is in the DMB pool.

## IMS Transaction Manager control blocks

The following figure shows the IMS Transaction Manager control blocks.

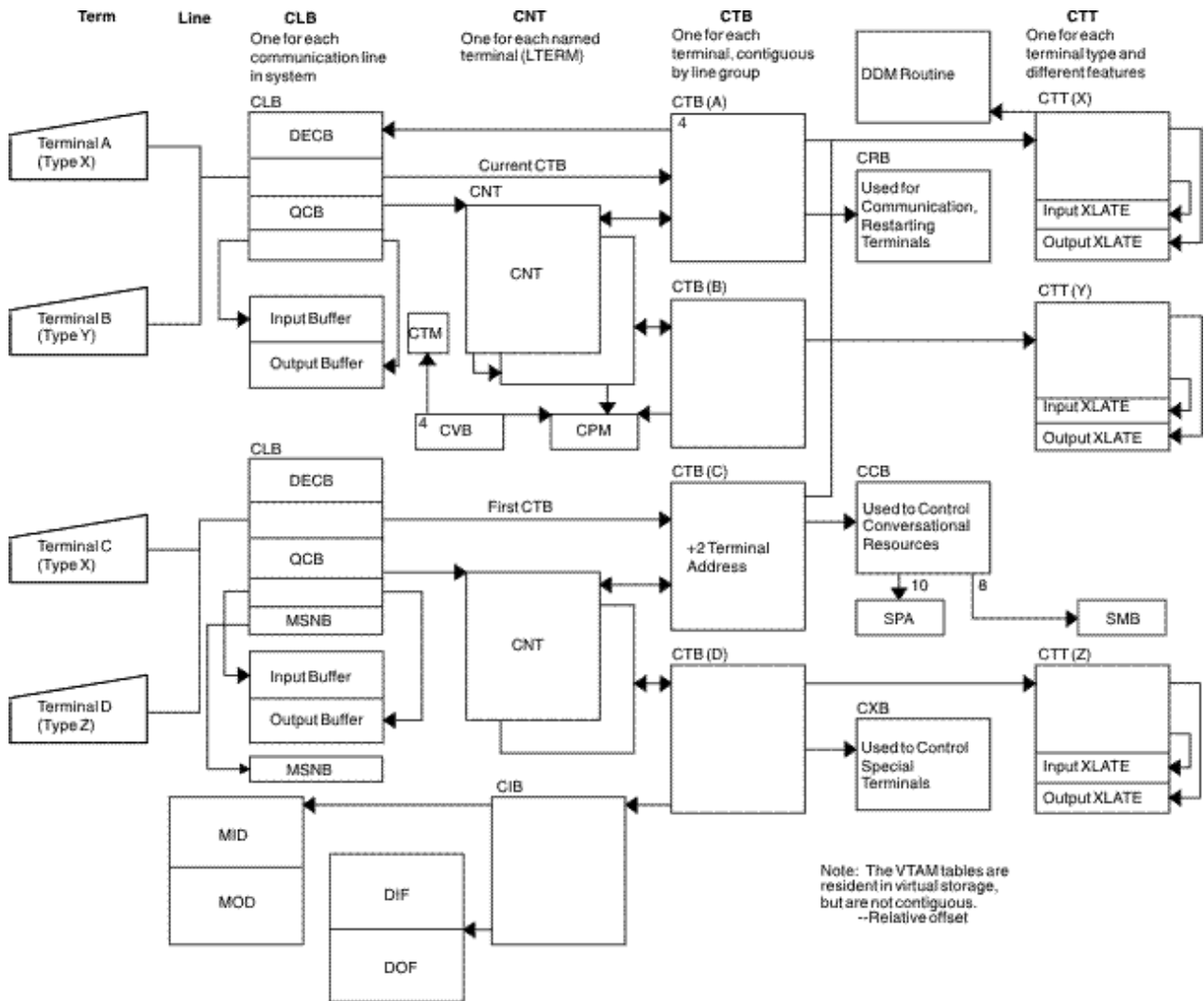
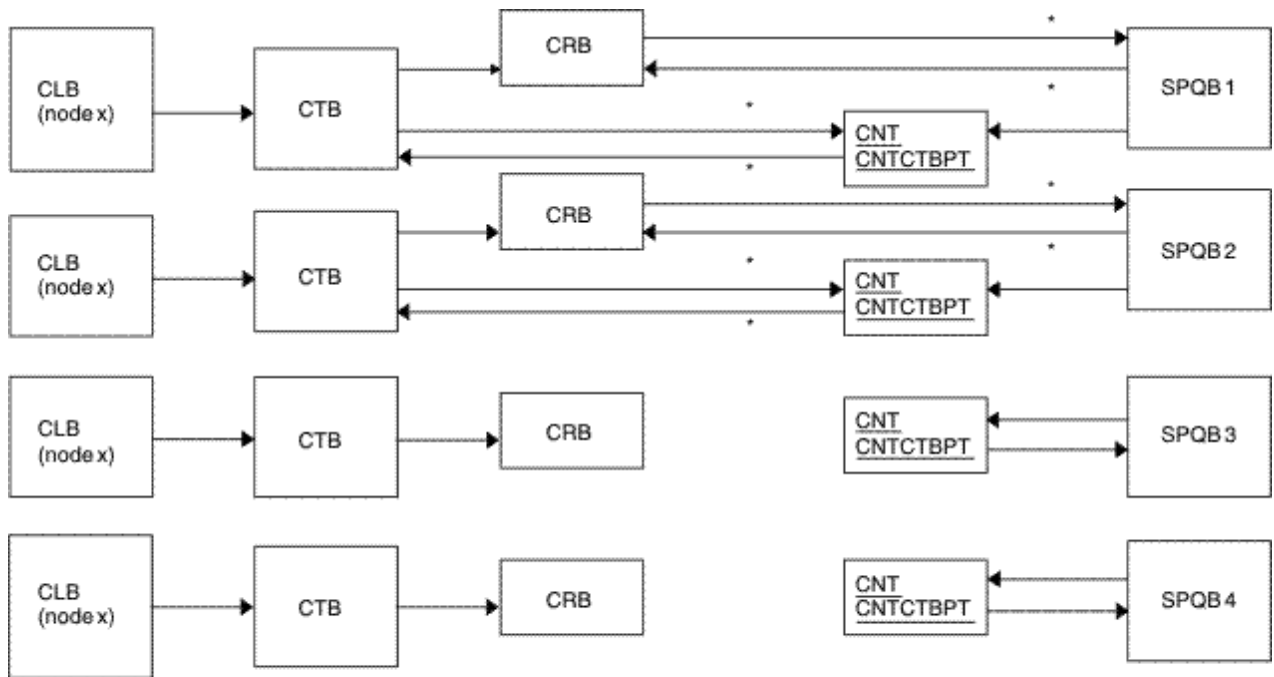


Figure 29. IMS Transaction Manager control blocks

## Intersystem communication control block structure

The following figure shows the intersystem communication control block structure.



**Note**

Subpool Queue Blocks (SPQB1 and SPQB2) are allocated for sessions. SPQB3 and SPQB4 are not. One SPQB is required for each parallel session.

\* Asterisks indicate that these pointers are set when blocks are allocated.

Figure 30. Intersystem communication control block structure

**VTCB load module**

The following figure shows the VTCB Load Module.



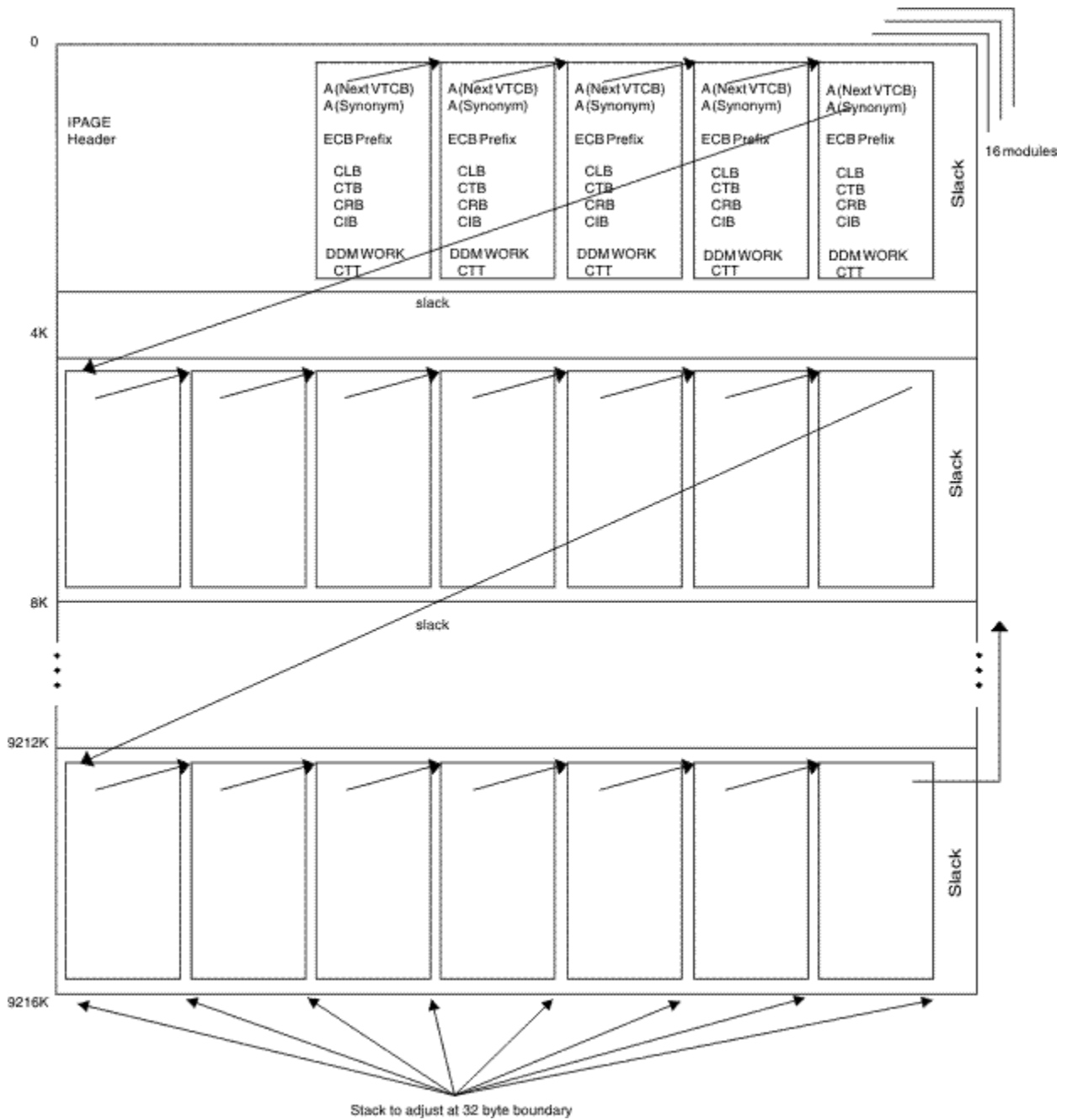


Figure 31. VTCB load module

As illustrated in the following figure, IMS maintains a VTAM terminal control block (VTCB) for each VTAM terminal except MSC VTAM terminals. A VTCB can contain a:

- Communication line block (CLB)
- Communication terminal block (CTB)
- Communication restart block (CRB)
- Communication interface block (CIB)
- Device-dependent module (DDM) work area
- Communication terminal table (CTT) (used only for ETO terminals)

The system of pointers between blocks within a VTCB is the same as the system of pointers used for VTAM terminals.

Some terminals do not require all six blocks. For example, static VTAM blocks use a statically created CTT.

You can find the VTCB for a terminal through the terminal's node name. To do so, you use the DFSCBTS macro interface.

### Multiple Systems Coupling (MSC) control block overview

The following figure shows the Multiple Systems Coupling (MSC) control block overview.

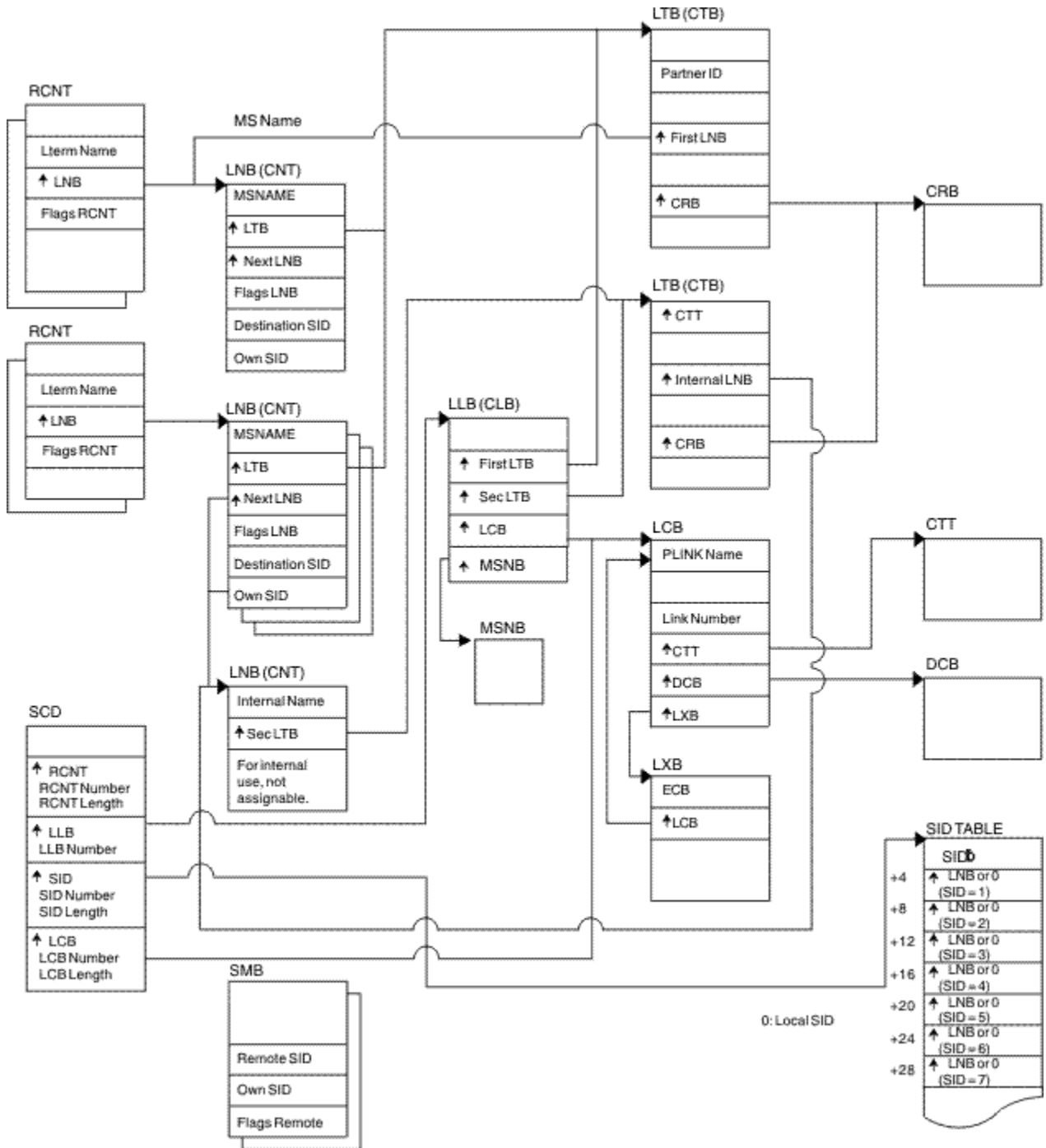


Figure 32. Multiple Systems Coupling (MSC) control block overview

### Multiple Systems Coupling (MSC) main storage-to-main storage control block overview

The following figure shows the Multiple Systems Coupling (MSC) Main Storage-to-Main Storage control block overview.

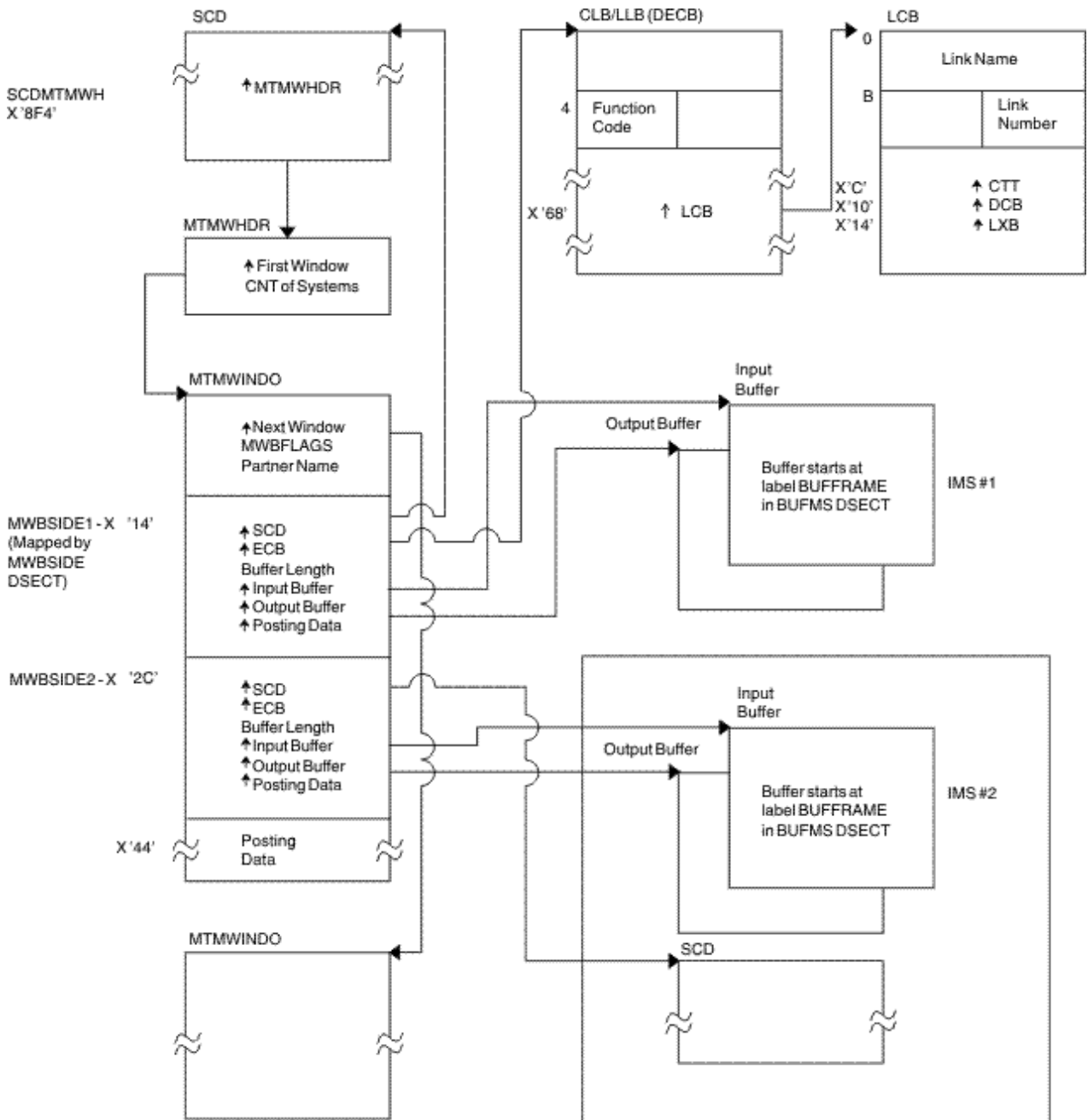


Figure 33. Multiple Systems Coupling (MSC) main storage-to-main storage control block overview

### z/OS storage map showing IMS-to-IRLM interrelationships

The following figure shows a z/OS storage map displaying IMS-to-IRLM interrelationships.

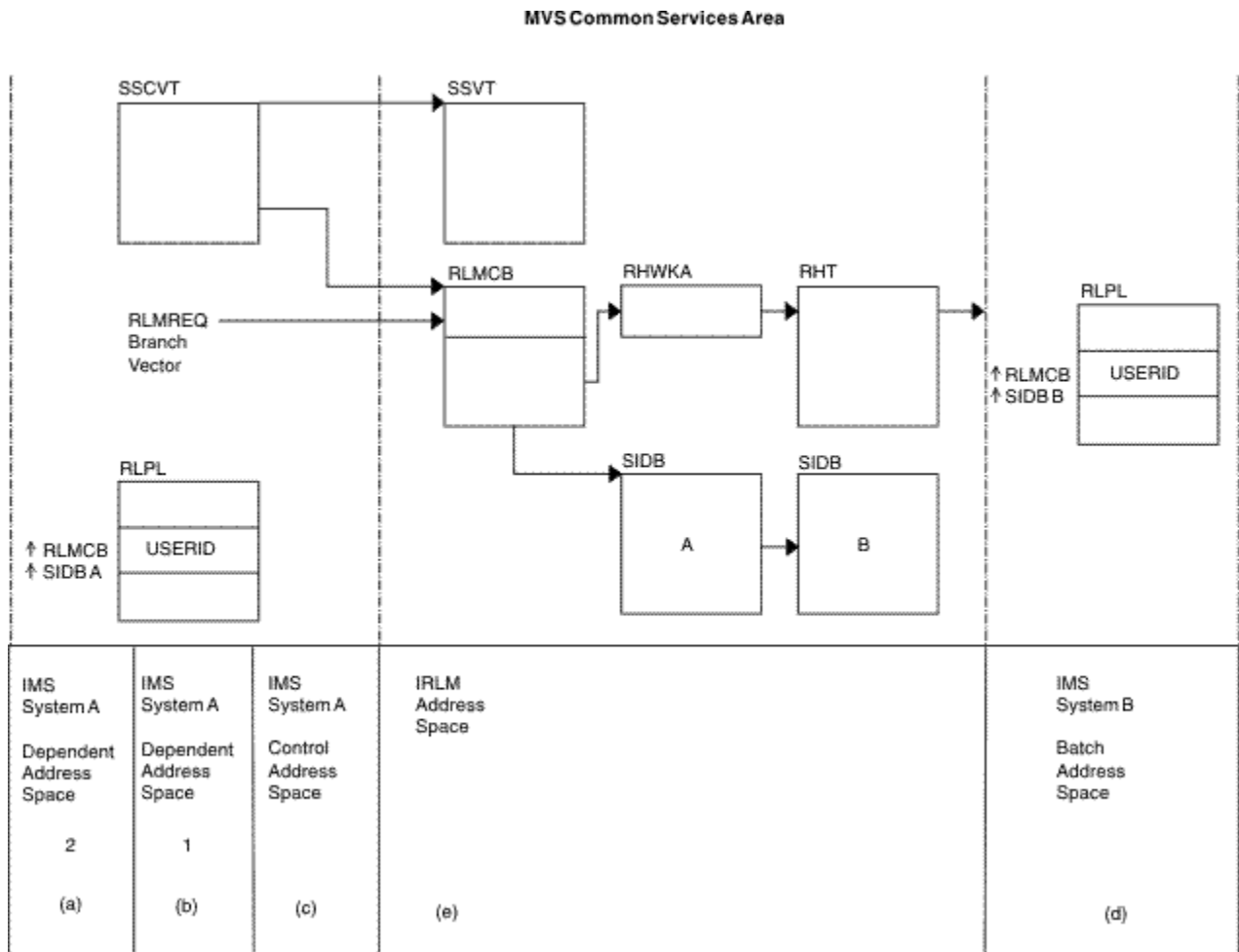


Figure 34. z/OS storage map showing IMS-to-IRLM interrelationships

**Notes to Figure 34 on page 118:**

1. (a), (b), and (c) are z/OS address spaces that make up one online IMS subsystem.
2. (d) is a z/OS address space containing an IMS batch subsystem.
3. (e) is an IRLM address space to which the two IMS subsystems are connected.
4. The RLPLs used by both IMS subsystems reside in the z/OS common services area (CSA).
5. To obtain and release global locks, the IMS subsystems branch to the IRLM code (The subsystems enter the IRLM code through the RLMREQ branch vector within the RLMCB that resides in the CSA.)
6. The IRLM control block structure that controls the global locks resides in the CSA.
7. When PC=YES is in effect, the RHT is in a private address space.

**IRLM overall control block structure**

The following figure shows the overall control block structure of IRLM.

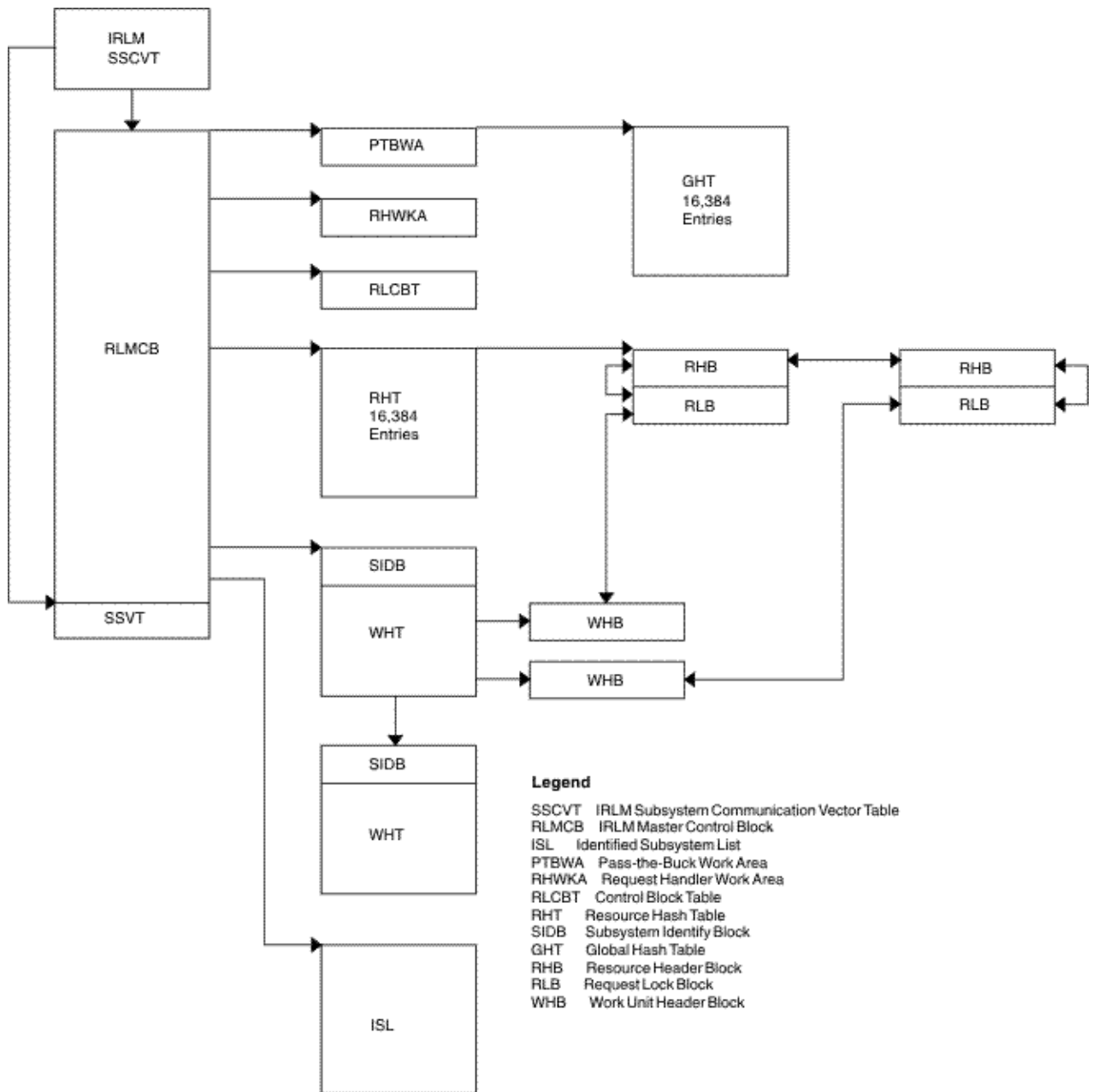
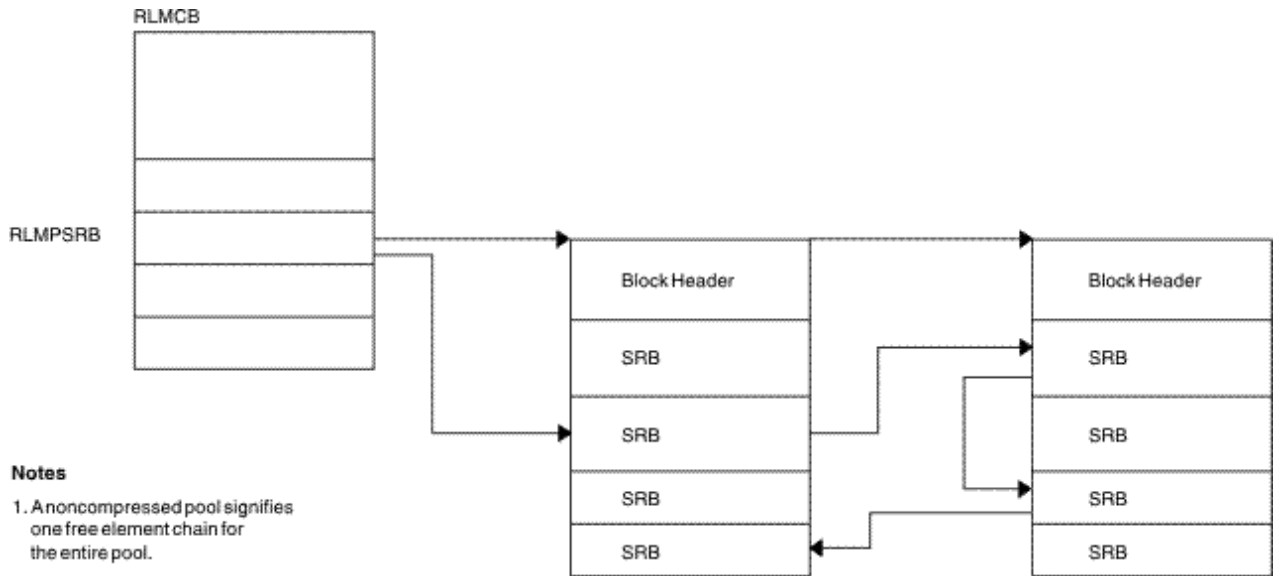


Figure 35. IRLM overall control block structure

### IRLM storage manager pools

The following figure shows the IRLM Storage Manager pools.



**Notes**

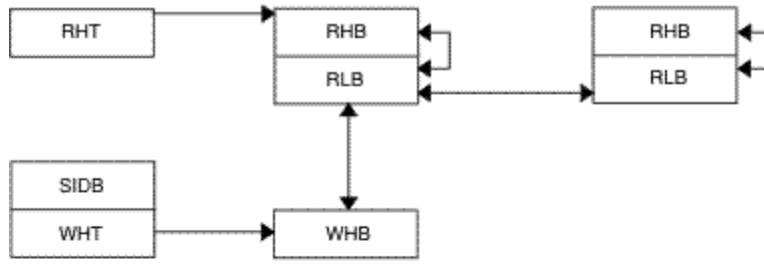
1. A noncompressed pool signifies one free element chain for the entire pool.
2. A compressed pool signifies one free element chain per block.
3. RLMPSRB is the SRB storage pool header block.

Example of a noncompressed pool-free chain

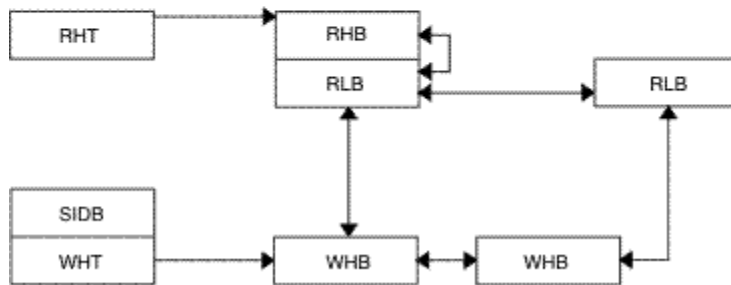
Figure 36. IRLM storage manager pools

**IRLM lock request examples**

The following figure shows examples of IRLM lock requests.



(One work unit holds a lock on two resources.)



(Two work units hold a lock on the same resource.)

Figure 37. IRLM lock request examples

**Control block overview of Database Recovery Control (DBRC)**

The following figure shows an overview of the Database Recovery Control (DBRC) control blocks.

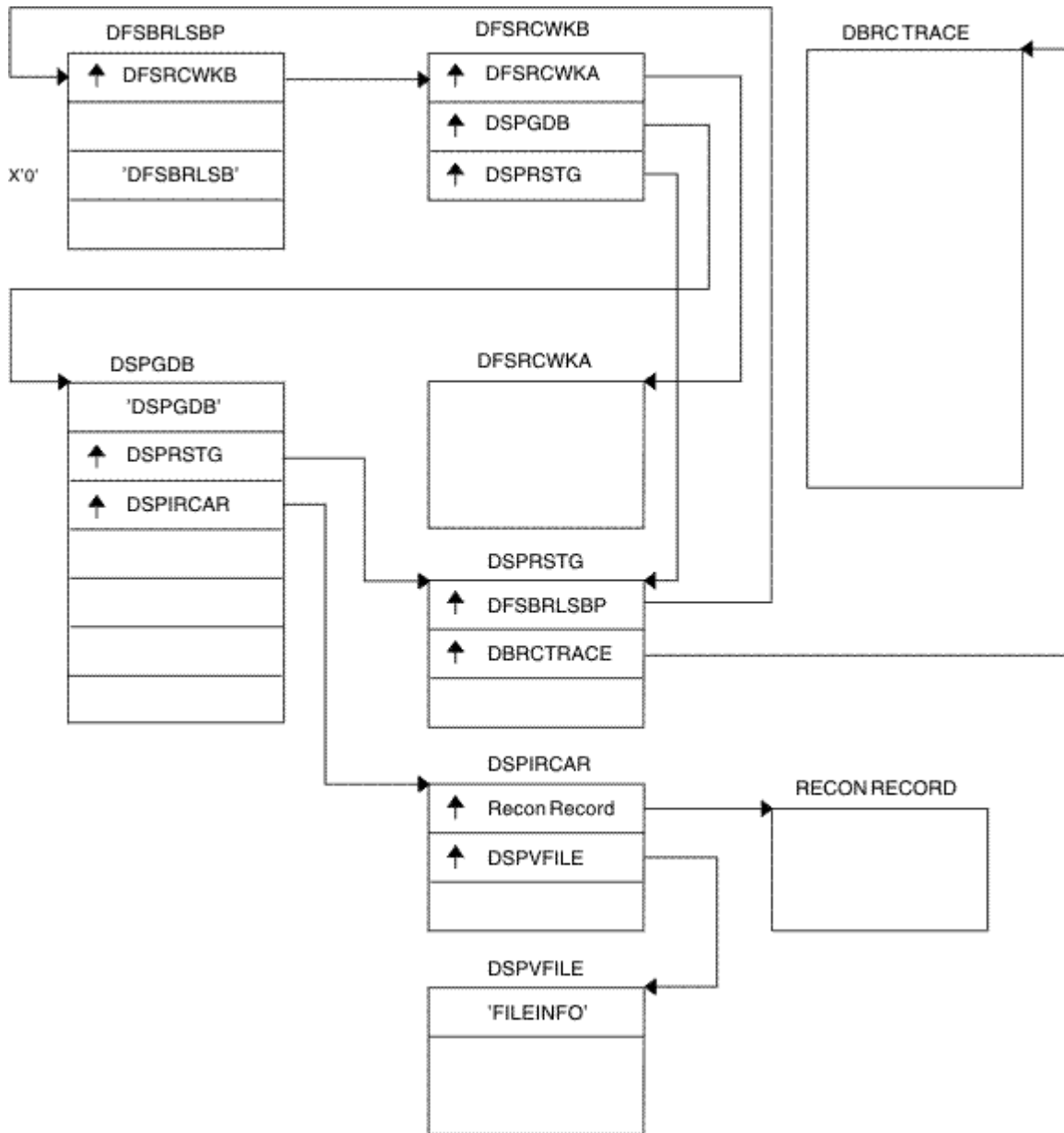


Figure 38. Control block overview of Database Recovery Control (DBRC)

**Organization and basic linkages: DOF (Device Output Format) and MOD (Message Output Descriptor)**

The following figure shows the organization and basic linkages of Description Output Format (DOF) and Message Output Descriptor (MOD).

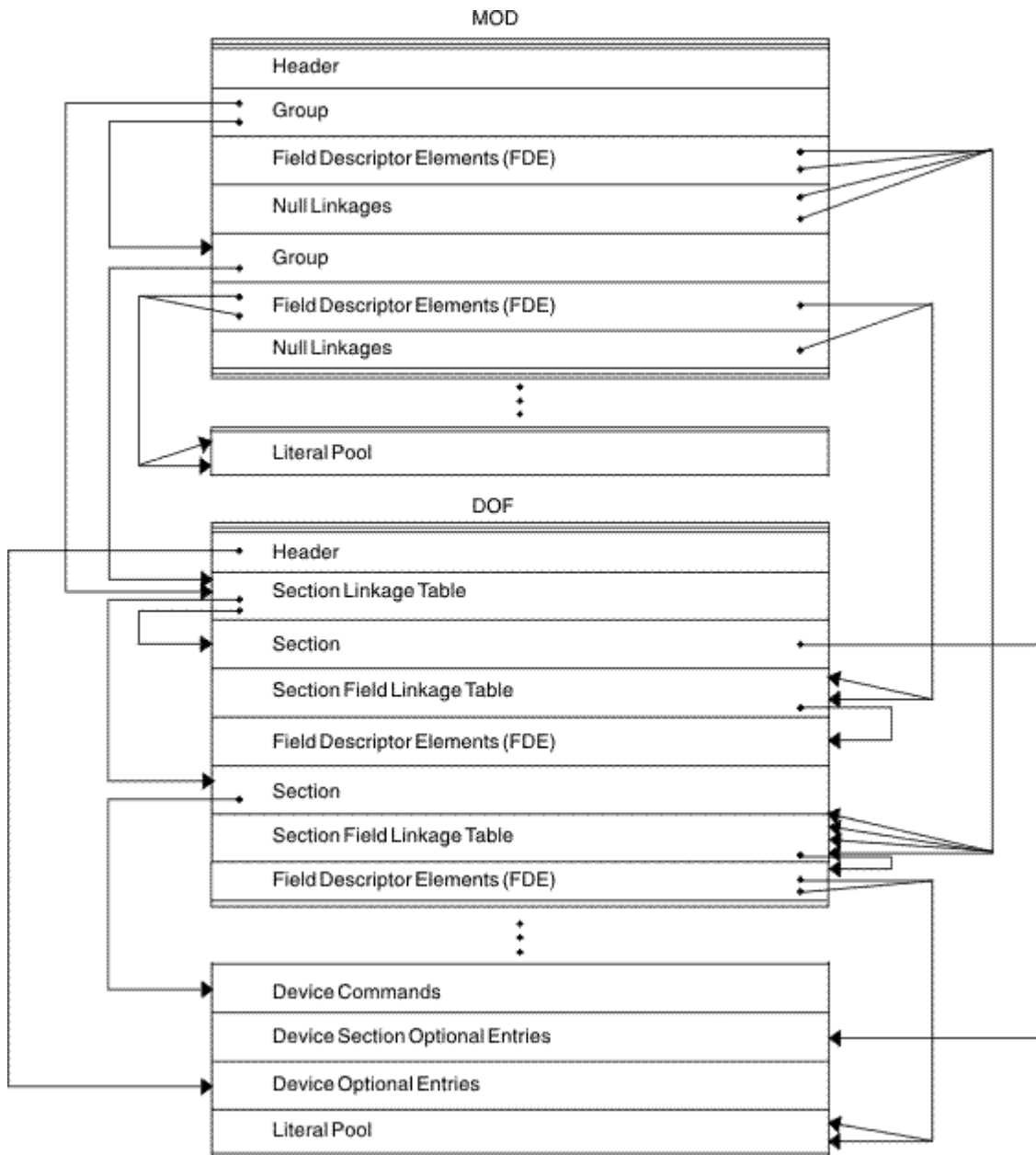


Figure 39. Organization and basic linkages: DOF (Device Output Format) and MOD (Message Output Descriptor)

**Organization and basic linkages: DIF (Device Input Format) and MID (Message Input Descriptor)**

The following figure shows the organization and basic linkages between Device Input Format (DIF) and Message Input Descriptor (MID).



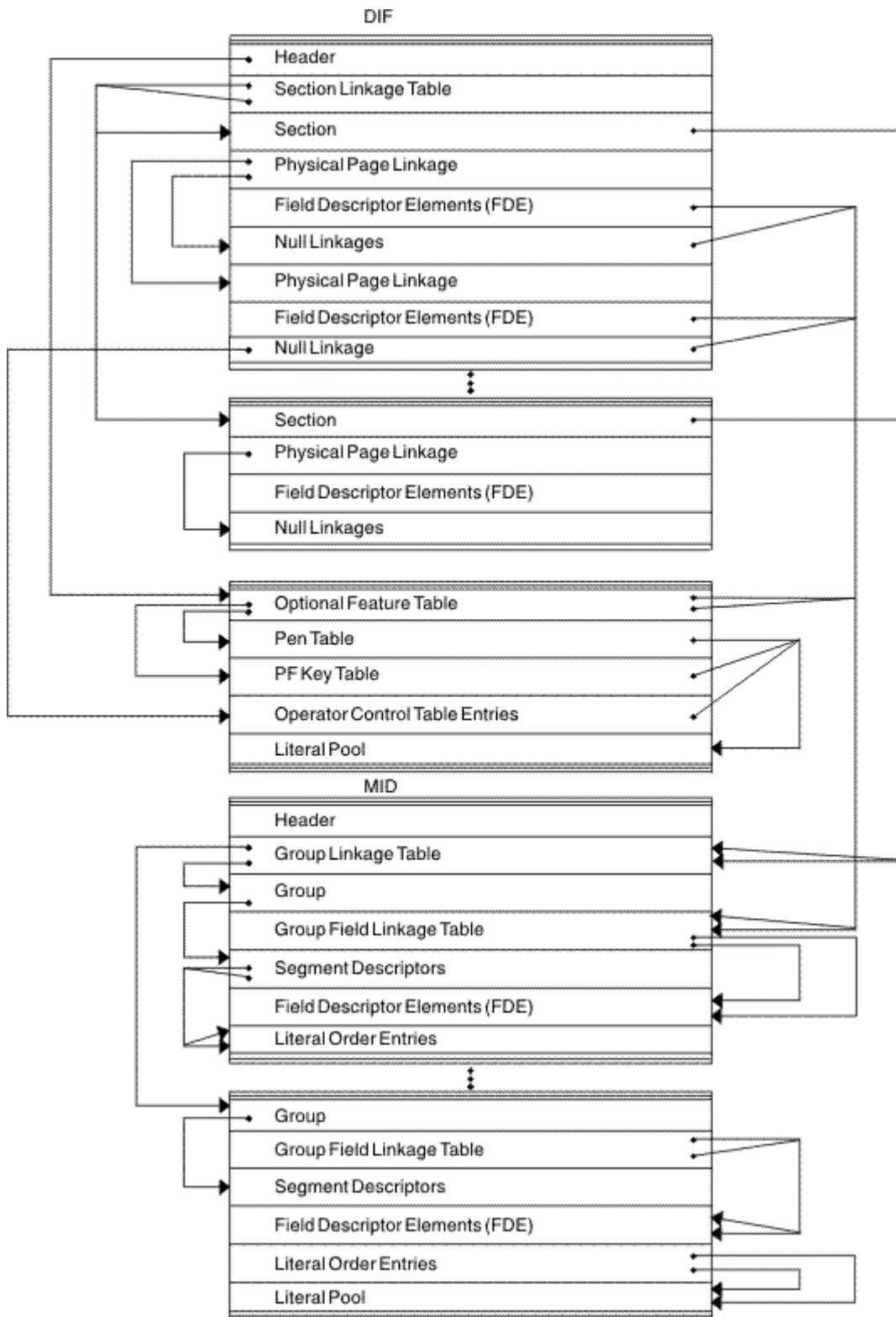


Figure 40. Organization and basic linkages: DIF (Device Input Format) and MID (Message Input Descriptor)

## DL/I record formats

The DL/I address space has seven distinct record formats.

### HSAM and SHSAM database

HSAM and SHSAM databases share the following record formats.

#### Segment Formats

The following figure shows the DL/I data record formats for HSAM and SHSAM databases.

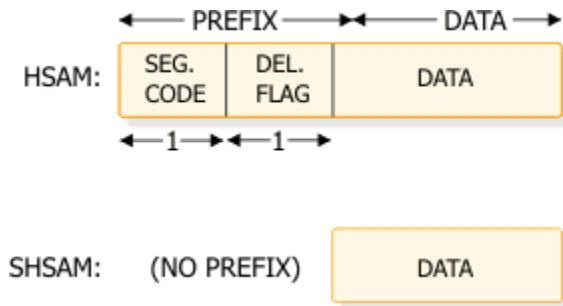


Figure 41. HSAM and SHSAM segment format

#### Delete Byte (Flag) Format

The following figure shows the delete byte (flag) format.

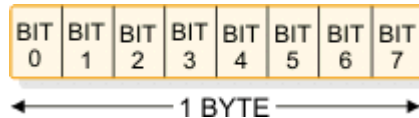


Figure 42. Delete byte (flag) format

#### Bit

##### Description

- 0** Segment deleted (HSAM or index).
- 1** DB record deleted (HSAM or index).
- 2** Segment processed by DELETE.
- 3** Reserved.
- 4** Data and prefix are separated in storage.
- 5** Segment has been deleted on its physical path.
- 6** Segment has been deleted on its logical path.
- 7** Segment space available to be freed; bits 5 and 6 must also be set on.

#### Block Format for HSAM and SHSAM

There are no dependent segments in a SHSAM block. Block size must be a multiple of segment size. The following figure shows the block format for HSAM and SHSAM.

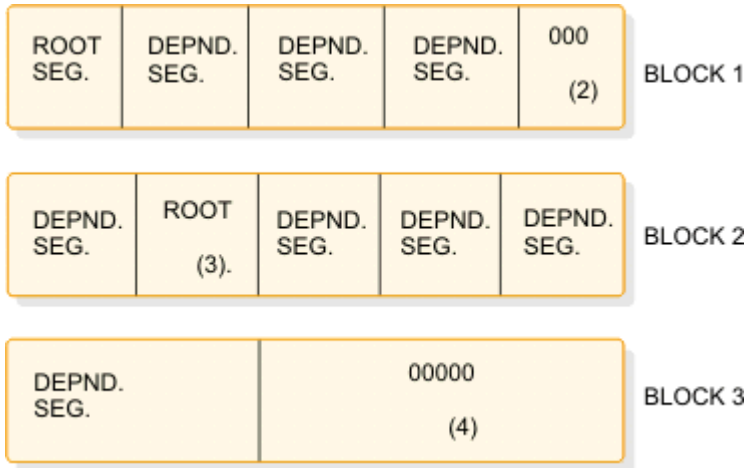


Figure 43. Block format for HSAM and SHSAM

**Notes:**

1. Pad with zeros if no room for next segment.
2. Next database record starts immediately.
3. Pad with zeros in last block, after last segment.

**HISAM and SHISAM database**

HISAM and SHISAM databases share the following record formats.

**Segment Format**

Figure 44 on page 125 and Figure 45 on page 125 show the segment format of HISAM and SHISAM.

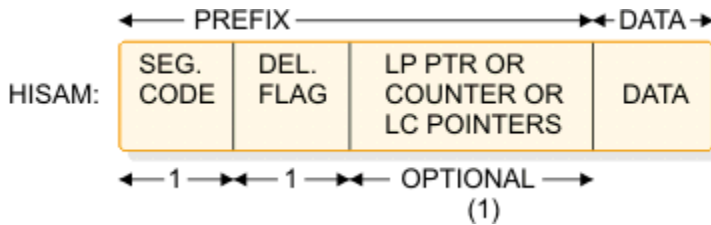


Figure 44. HISAM segment format

**Note:**

1. This field can be omitted, or it can be used to hold:
  - A 4-byte LP pointer (if this segment is an LC).
  - A 4-byte counter (if this segment is an LP).
  - One or more 4-byte LC pointers (if this segment is an LP).



Figure 45. SHISAM segment format

**Note:** This diagram is for a root-only database.

## LRECL Format

The following figure shows the LRECL format.

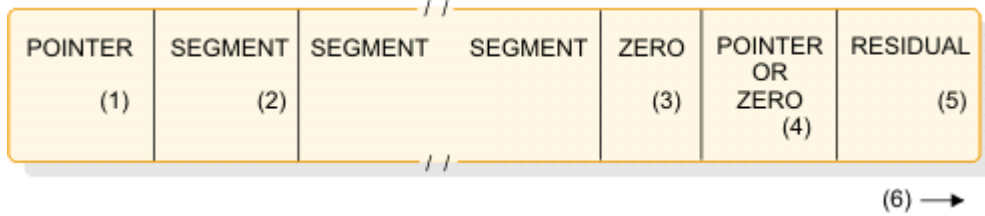


Figure 46. LRECL format

### Notes:

1. 4-byte RBA of ESDS record containing additional dependent segments for this root occurrence.  
SHISAM: This field is omitted.
2. HISAM: Segment includes prefix and data.  
SHISAM: Segment includes only data (no prefix). (See [Figure 45 on page 125](#))
3. 1-byte of zeros indicates the end of segments in this LRECL.
4. This field is omitted.
5. Space not used.
6. VSAM LRECLs must have an even length.

## VSAM Block Formats

The following figure shows the VSAM block formats.



Figure 47. VSAM block formats

### Notes:

1. LRECL length might change between KSDS and ESDS, depending on user definition.
2. 10 bytes in a blocked data set; 7 bytes in an unblocked data set.

## HDAM, HIDAM, PHDAM, or PHIDAM database

HDAM, HIDAM, PHDAM, and PHIDAM databases share the following record format.

### Segment Format

The following figure shows the segment format of HDAM, HIDAM, PHDAM, and PHIDAM databases.

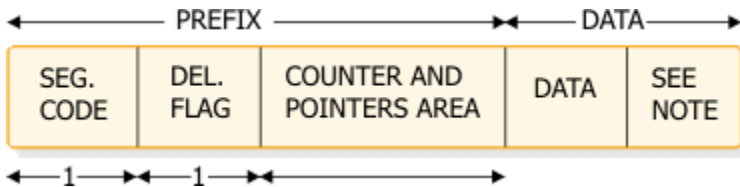


Figure 48. HDAM, HIDAM, PHDAM, or PHIDAM segment format

In order for all segments to be half-word-aligned, a slack byte is added to the end of any segment whose length is an odd number.

### Prefix of a Segment

The following figure maps the prefix of a segment.

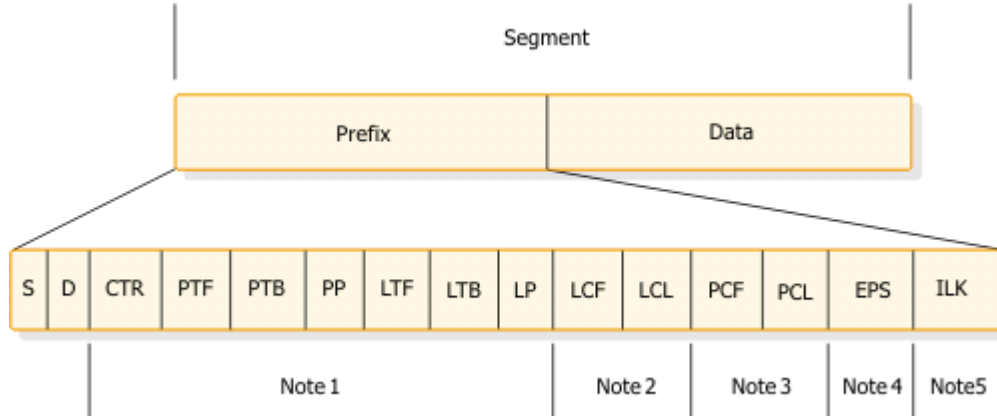


Figure 49. Mapping the prefix of a segment

### Notes to Figure 49 on page 127:

1.

#### Prefix Flag

##### Prefix Flag Description

Segment code (S)

Delete flag (D)

The pointers that exist in this section of the prefix are identified in the PSDB field DMBPTR, as shown in the following list:

#### X'80'

Counter (CTR) for logical relationships

#### X'40'

Physical twin forward (PTF)

#### X'20'

Physical twin backward (PTB)

#### X'10'

Physical parent (PP)

#### X'08'

Logical twin forward (LTF)

#### X'04'

Logical twin backward (LTB)

#### X'02'

Logical parent (LP)

## **X'01'**

Hierarchical direct pointing (For twin-type pointing, this bit is off)

### **2.**

How to locate all logical children: logical child first (LCF); logical child last (LCL)

#### **a.**

At DMBFLAG, if flag DMBLCEX (X'20') is on, then DMBLST points to a secondary list for this segment. Secondary lists are used for information concerning indexes, logical children, or the logical parents.

#### **b.**

Secondary list entries whose field DMBSCDE (SEC+0) has flag DMBSLC (X'02') on are descriptions of logical children for a logical parent. Within these secondary lists, the field DMBSLCFL (X'02') has the number of the first and last logical child pointers in the prefix of the logical parent.

#### **c.**

A logical parent can have multiple types of logical children; thus, there can be more than one logical child secondary list entry for a logical parent. The last secondary list for each segment has the DMBSND flag (X'80') set on in the field DMBSCDE (SEC+0).

### **3.**

How to locate all physical children: physical child first (PCF); physical child last (PCL)

#### **a.**

Physical child pointers are only present if this segment uses twin-type pointing rather than hierarchic-type pointing. The PSDB entries for the children of the segment being mapped indicate the number of the pointer in the prefix of the parent segment which points to the first and last occurrence of the child segments.

#### **b.**

The PSDB fields DMBPPFD and DMBPPBK are used for these numbers. The PSDB entries for the children of the segment being mapped can be found by scanning the PSDBs for those segments with a parent segment code (PSDB+1) that matches the segment code (PSDB+0) of the segment being mapped.

### **4**

An EPS (extended pointer set) that is 28 bytes in length is present in the prefix of an LC segment prefix of a HALDB.

### **5**

An ILK (indirect list entry key) that is 8 bytes in length is present in each segment of a PHIDAM or PHDAM.

## **Related concepts**

“Dump analysis introduction” on page 156

In a pseudoabend supervisor call (SVC) dump that is generated by module DFSERA20, you can find the failing program specification table (PST) by searching the save areas for the caller of module DFSERA20. In the save area flow, DFSERA20 is called INTERA20 and register 1 contains the failing PST address.

## **OSAM and VSAM ESDS block format**

OSAM and VSAM ESDS blocks share the following format.

### **Block format**

The following figure shows the OSAM and VSAM ESDS block format.

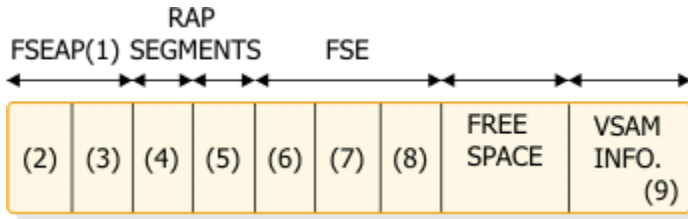


Figure 50. OSAM and VSAM ESDS block format

**Notes:**

1. Free space element anchor point.
2. 2-byte offset to first free space element; contains zeros in a bit map block.
3. 2-byte length (see 7); value is zero.
4. 4-byte root anchor point (RAP). The number per block is specified in DBDGEN, except if HIDAM with TF (and not TB) is pointing at root level, one anchor point per block is provided and it heads a LIFO chain of roots inserted in that block. If HIDAM or PHIDAM with TB or NT is pointing at the root level, there are no anchor points provided.
5. User database segments (prefix and data). In a bit map block, the bit map starts here and extends to the end of the block or to the VSAM control information.
6. 2-byte offset to next free space element (FSE) from start of block.
7. 2-byte length of free space, including 8-byte FSE.
8. 4-byte identification of the task that freed this space.
9. 7 bytes of VSAM control data; omitted for OSAM.

This format applies at the conclusion of initial load. The subsequent deletion of segments can result in free space elements that alternate with user database segments.

**VSAM LRECL for a primary index**

The format of a VSAM LCRECL for a primary index depends on whether it is currently on a storage device, in the buffer pool, or being returned by the buffer handler.

**Format on a storage device or in the buffer pool**

The following figure shows the format on a storage device or in the buffer pool.



Figure 51. LRECL format on storage device and in buffer pool

**Note:**

1. Four-byte RBA pointer to VSAM database root segment whose key value is the same as the value in the next field of this segment.

### Format as returned by the buffer handler

The following figure shows the VSAM LRECL format as returned by buffer handler (1).

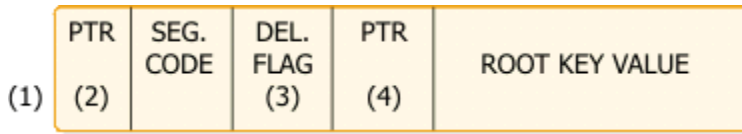


Figure 52. VSAM LRECL format as returned by buffer handler

#### Notes:

1. Same as buffer pool format, except for pointer and segment code in front.
2. Four-byte pointer with value of zero.
3. The segment code value is 01.
4. Four-byte RBA pointer to VSAM database root segment whose key value is the same as the value in the next field of this segment.

### VSAM block format on a storage device or in the buffer pool

The following figure shows the VSAM block format on device and in buffer pool.



Figure 53. VSAM block format on device and in buffer pool

## Secondary index or PSINDEX database (VSAM only)

The LRECL Format on Device and in Buffer Pool are described.

### LRECL Format on Device and in Buffer Pool

One segment per LRECL. The following figure shows the LRECL Format on Device and in Buffer Pool.

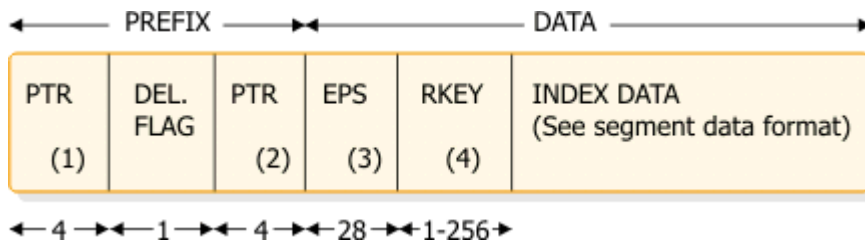


Figure 54. LRECL format on device and in buffer pool

#### Notes:

1. Nonunique keys: This points to ESDS LRECL with the same key value. Unique keys or PSINDEX: This field is omitted.
2. Direct pointer to index target segment. Omit this field if symbolic pointing is used or if this is a HALDB PSINDEX.



3

The EPS is present only if this is a HALDB PSINDEX. The 4-byte pointer to the target segment is included in the EPS.

4

RKEY means root key. The RKEY field is present only if this is a HALDB PSINDEX. This is the key value for the root of the target segment and its length can be from 1 to 256 bytes.

**LRECL as Returned by Buffer Handler**

The following figure shows LRECL as returned by buffer handler.

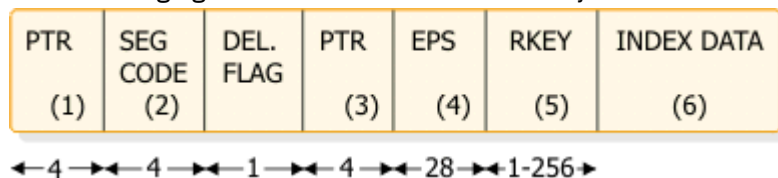


Figure 55. LRECL as returned by buffer handler

**Notes:**

1.

Four-byte pointer contains zeros.

2.

Code value is 01.

3.

Direct pointer to index target segment. Omit this field if symbolic pointing is used or if this is a HALDB PSINDEX.

4

The EPS is present only if this is a HALDB PSINDEX. The 4-byte pointer to the target segment is included in the EPS.

5

The RKEY field is present only if this is a HALDB PSINDEX. This is the key value for the root of the target segment and its length can be from 1 to 256 bytes.

6

Sequential segment data format.

**Block Format on Device and in Buffer Pool**

The following figure shows the block format on device and in buffer pool.



Figure 56. VSAM block format on device and in buffer pool

**Segment Data Format**

The following figure shows the segment data format.

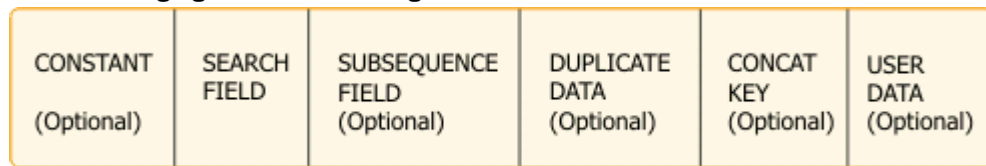


Figure 57. Segment data format

## Variable-length segments

The HISAM, HDAM, HIDAM, PHDAM, and PHIDAM Segment Format are described.

### HISAM, HDAM, HIDAM, PHDAM, and PHIDAM Segment Format

The following figure shows the HISAM, HDAM, HIDAM, PHDAM, and PHIDAM Segment Format.

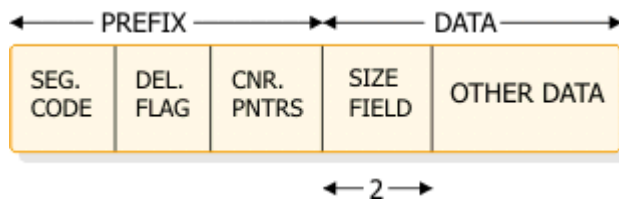


Figure 58. HISAM, HDAM, HIDAM, PHDAM, and PHIDAM segment format

**Note:** Variable-length segment must have a 2-byte length field at the front of the DATA portion.

### HDAM, HIDAM, PHDAM, and PHIDAM

When prefix and data are separated. The following figure shows HDAM, HIDAM, PHDAM, and PHIDAM.

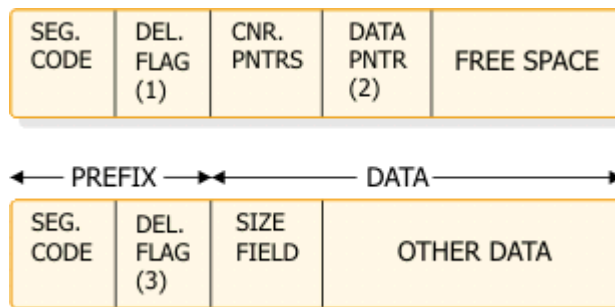


Figure 59. HDAM, HIDAM, PHDAM, and PHIDAM

#### Notes:

1. DEL FLAG containing X'08' indicates that the data has been separated from the prefix.
2. DATA PNTR is a direct pointer to the segment containing the "other data".
3. The flag value is X'FF'.

---

## Chapter 6. CQS - Common Queue Server service aids

Use trace records, log records, and utilities to analyze problems in Common Queue Server (CQS).

### Diagnosing a CQS related problem

---

CQS produces SDUMPs for internal errors. The CQS dumps are in the SYS1.DUMP data sets. CQS can also produce LOGREC data set entries for errors.

#### CQS related problems

For a CQS environment, related problems might include:

- IMS WAIT problems
- CQS WAIT/HANG problems
- CQS checkpoint problems
- CQS restart problems
- CQS structure rebuild problems

Implement normal operating procedures to preserve the following documentation close to the time the error occurred:

- Additional manual dump intervention
- z/OS log stream (for problems related to IMS shared queues)
- Most recent SRDS (structure recovery data set) for each dumped structure

For a CQS WAIT/HANG problem, obtain dumps and syslogs of CQS address spaces in the sysplex such as:

- One dump and syslog from the master CQS
- One dump and syslog from the non-master CQS
- One dump and syslog from the error CQS
- One dump and syslog from the normal CQS

A sysplex contains only one master CQS and, most likely, one error CQS in a sysplex. Thus, the maximum number of CQS dumps and syslogs taken is three. If the sysplex contains fewer than three CQS address spaces, then dumps and syslogs of all CQS address spaces are needed.

Before obtaining the syslog, issue the following z/OS DISPLAY commands to write the sysplex information to the syslog:

```
D CF,CFNAME=cfname
D XCF,CF
D XCF,STRUCTURE,STRNAME=strname
```

For a CQS loop problem, obtain two dumps. To obtain the two dumps:

1. Obtain a z/OS SVC dump of the CQS and its associated IMS control region address space by issuing the following command:

```
DUMP COMM=(dump title)
R id,JOBNAME=(j1,j2),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),END
```

In this command, *j1* is the CQS job name, and *j2* is the IMS control region job name.

2. Save the IMS log data sets that are created during the error period.

3. Save the current z/OS log data sets that are created. You can copy the current z/OS log data sets for the CQS log stream by using the IEBGENER utility. No z/OS log data sets are logged (unlike the IMS logger, which does have log archive capability through SLDS).

If an isolated event type within CQS encounters an error, IBM Software Support might request additional trace level settings for the various trace types. If a structure rebuild or structure checkpoint related problem occurs, you will also need to dump the CQS address spaces for any CQS associated with the given structure, and save the associated SRDS (structure recovery data set) for the CQS structure checkpoints and CQS system checkpoints.

## CQS additional manual intervention for dump creation

Additional considerations for dump creation are presented.

### Additional dump considerations

CQS environment additional dump considerations include:

- Structure dumps
- CQS regions and other CQS clients with their related CQS regions
- CQS regions and other CQS clients with their related CQS regions from other IMSplex members
- z/OS Logger

## CQS structure dump contents

CQS structure dumps should include the primary structures, the overflow structures, and the associated lock entries.

### CQS structure dump example

The following example shows the STRLIST for a dump:

```
DUMP COMM=(MSGQ STRUCTURE DUMP)
R nn,
  STRLIST=(STRNAME=imsmsgq01, LOCKE, (LISTNUM=ALL, ADJ=CAPTURE, EDATA=UNSER),
  STRNAME=imsmsgq01oflw, LOCKE, (LISTNUM=ALL, ADJ=CAPTURE, EDATA=UNSER)), END
```

Where *imsmsgq01* is the main structure name, and *imsmsgq01oflw* is the overflow structure name.

When an IMS structure dump is necessary, the z/OS Logger function might be involved with the problem. The following example dumps the z/OS Logger address spaces, the logger structure, and the IMS CF structure.

```
DUMP COMM=(CQS/LOGR STRUCTURE DUMP)
R xx, STRLIST=(STRNAME=imsmsgq01, LOCKE,
  (LISTNUM=ALL, ADJ=CAPTURE, EDATA=UNSER), CONT
R xx, STRNAME=imsmsgq01oflw, LOCKE,
  (LISTNUM=ALL, ADJ=CAPTURE, EDATA=UNSER), CONT
R xx, STRNAME=mvslogqmsg01, LOCKE, ACC=NOLIM,
  (LISTNUM=ALL, EDATA=UNSER, ADJ=CAPTURE)), CONT
R xx, JOBNAME=(IXGLOGR), DSPNAME=(' IXGLOGR' .SYSLOGR0), CONT
R xx, SDATA=(COUPLE, ALLNUC, LPA, LSQA, PSA, RGN, SQA, TRT, CSA, GRSQ, XESDATA), END
```

Where:

#### ***imsmsgq01***

The main structure name.

#### ***imsmsgq01oflw***

The overflow structure name.

#### ***mvslogqmsg01***

The associated logger structure.

## CQS - IEADMCxx example with structures

Create three SYS1.PARMLIB members named IEADMCIA, IEADMCIB, and IEADMCIC by issuing the following command:

```
JOBNAME=(j1,j2,j3,j4,j5),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),  
REMOTE=(SYSLIST=(*'j1','j2','j3','j4','j5'),SDATA))
```

Where:

### **j1**

IMS Control Region Jobname.

### **j2**

IMS DLI Region Jobname.

### **j3**

DBRC Region Jobname.

### **j4**

IRLM Region Jobname.

### **j5**

IMS CQS Region.

```
JOBNAME=(j6,j7,j8,j9,j10),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,XESDATA),  
REMOTE=(SYSLIST=(*'j6','j7','j8','j9','j10'),SDATA))
```

Where:

### **j6**

APPC Region.

### **j7**

APPC Scheduler.

### **j8**

VTAM.

### **j9**

Other CQS Client Region.

### **j10**

Other CQS Region.

```
JOBNAME=(IXGLOGR),DSPNAME=('IXGLOGR'.SYSLOGR0),  
SDATA=(COUPLE,ALLNUC,LPA,PSA,RGN,SQA,TRT,CSA,GRSQ,XESDATA),  
STRLIST=(STRNAME=imsmsgq01,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),  
STRNAME=imsmsgq01oflw,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),  
STRNAME=mvslmqmsg01,LOCKE,ACC=NOLIM,(LISTNUM=ALL,EDATA=UNSER,ADJ=CAPTURE))
```

Where:

### **imsmsgq01**

The main structure name.

### **imsmsgq01oflw**

The overflow structure name.

### **mvslmqmsg01**

The associated logger structure.

## CQS - IEADMCxx dump activation

To create a dump from the IEADMCIA, IEADMCIB and IEADMCIC parmlib members, issue the following z/OS command: DUMP TITLE=(DUMP OF IMSplex and Partners),PARMLIB=(IA,IB,IC).

Three dump data sets are created on the z/OS image from which the command is issued. Two dump data sets are created on each image in the sysplex that matches the REMOTE specifications for the JOBNAMEs.

**Recommendation:** Provide the z/OS logger address space from the system experiencing problems to z/OS logger support.

## CQS - z/OS log stream example

The merged z/OS log stream can be used to examine CQS log records. IEBGENER can be used along with the default log stream subsystem exit routine, IXGSEXIT, to copy the log records at time of failure for later analysis.

```
//CQSCPYLG JOB USERID,USERID,MSGLEVEL=1,CLASS=K
//*****
//* This job copies a CQS log stream to a dataset (max 32K / record) *
//*
//* - Replace the DSN on the SYSUT1 card with your CQS logstream *
//* name. *
//*
//* - Replace the DSN on the SYSUT2 card with your desired output *
//* dataset name. You may also need to adjust the space *
//* allocations, depending on the size of your logstream. *
//*****
//STEP1 EXEC PGM=IEBGENER,REGION=1024K
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN DD DUMMY
//SYSUT1 DD DSN=SYSLOG.MSG001.LOG,
// SUBSYS=(LOGR,IXGSEXIT),
// DCB=(BLKSIZE=32760)
//SYSUT2 DD DSN=CQS.LOG.COPY,
// DISP=(NEW,KEEP,DELETE),
// VOL=SER=USER05,
// SPACE=(CYL,(2,10)),
// UNIT=SYSDA
```

## CQS structure recovery data set

Save the most recent CQS SRDS (structure recovery data set) for each structure that is dumped. Use the IDCAMS REPRO command if the LRECL is acceptable (less than 32 761).

## CQS checkpoint problems

There are two types of CQS checkpoints: system checkpoint and structure checkpoints.

### CQS checkpoint messages

Most problems are of structure checkpoint type because it is a sysplex-wide operation with shared resources (SRDS data set, structures on the CF), and it needs cooperation through z/OS IXLUSYNC between all CQs within the sysplex. Sometimes, another CQS process (initialization, termination, rebuild, overflow threshold, or overflow scan) can interfere with the checkpoint process and cause it to fail.

### CQS System Checkpoint Messages

1. CQS0030I for a successful CQS system checkpoint.
2. CQS0035E for a failed CQS system checkpoint. If the CQS system checkpoint failed with CQS0035E, refer to "CQS messages" in *IMS Version 14 Messages and Codes, Volume 2: Non-DFS Messages* for the details of the failure and the recommended system programmer action.

### CQS Structure Checkpoint Messages

The syslog of a successful CQS structure checkpoint will contain five CQS messages in the following order:

```
CQS0220I CQS cqsname START STRUCTURE CHECKPOINT FOR STRUCTURE strname
CQS0200I STRUCTURE strname QUIESCED FOR STRUCTURE CHECKPOINT
CQS0201I STRUCTURE strname RESUME AFTER STRUCTURE CHECKPOINT
CQS0030I SYSTEM CHECKPOINT COMPLETE, STRUCTURE strname LOGTOKEN logtoken
CQS0221I CQS COMPLETE STRUCTURE CHECKPOINT FOR STRUCTURE strname
```

If the CQS structure checkpoint failed with a CQS0222E message, refer to the "CQS messages" section in *IMS Version 14 Messages and Codes, Volume 2: Non-DFS Messages* for the details of the failure and the recommended system programmer action.

If message CQS0222E is not displayed and all five of the normal structure checkpoint messages did not appear on the console, CQS probably has encountered a serious WAIT/HANG problem.

The CQS log records, the structure dump of the related structure, and the SRDSs (structure recovery data sets) are helpful in diagnosing the problem. After collecting all the documents, you can stop the CQS in error and restart it to resolve the WAIT/HANG problem.

## CQS structure rebuild problems

---

The most common structure rebuild problem is a rebuild failure. Some environmental situations can occur that cause rebuild to fail.

### Rebuild failures

Other types of rebuild problems are much more rare, such as rebuild hanging, rebuild not being initiated when required, work hanging after a successful rebuild, rebuild losing data objects, and rebuild duplicating data objects. Follow these general steps to address any rebuild failure you encounter:

#### • Collect SYSLOGs

Collect the syslog for each LPAR that is running a CQS that is sharing queues. Evaluate each syslog for the following information:

- How the rebuild was initiated (operator command, structure failure, CF failure, link failure).
- How the rebuild was stopped (operator command or CQS).
- Rebuild master (CQS0240I message).
- Rebuild type (COPY or RECOVERY in CQS0240I message).
- Structure quiesced or resumed messages:
  - CQS0200I STRUCTURE *strname* QUIESCED FOR *reason*
  - CQS0201I STRUCTURE *strname* RESUMED AFTER *reason*
- Structure status change messages (CQS0202I).
- Structure rebuild messages:
  - CQS0240I CQS *cqsname* STARTED STRUCTURE *copy/recovery* FOR STRUCTURE *strname*
  - CQS0241I CQS *cqsname* COMPLETED STRUCTURE *copy/recovery* FOR STRUCTURE *strname*
  - CQS0242E CQS FAILED STRUCTURE *copy/recovery/rebuild* FOR STRUCTURE *strname*
  - CQS0243E CQS *cqsname* UNABLE TO PARTICIPATE IN REBUILD FOR STRUCTURE *strname*
  - CQS0244E STRUCTURE RECOVERY REQUIRED AFTER RECOVERY FAILURE FOR STRUCTURE *strname*
  - CQS0245E STRUCTURE *strname* REBUILD ERROR

#### • Consult the CQS Restart and Rebuild Error Reason Codes table

#### • Check rebuild status

Check the rebuild status by issuing the following command on every LPAR where a CQS participating in the rebuild resides:

```
D XCF,STRUCTURE,STRNAME=strname
```

If the output indicates that rebuild is waiting for a particular event, a CQS might not be responding to a rebuild event because it is hung or in a loop, which hangs the rebuild. Consider dumping the CQS address space and canceling the CQS that is not responding to the rebuild event, to see if that enables the rebuild to continue.

- **Analyze if structure still viable**

If a structure copy initiated by an operator failed, no action needs to be taken to restore access to the structure. The structure is still viable and you still have access. Analyze why the structure copy failed, to determine whether you need to take action to prevent a subsequent rebuild failure.

- **Restore link, if applicable**

If a structure rebuild was initiated because of a link failure and the structure rebuild failed, try to restore the link to restore access to the structure. The structure is still viable. Analyze why the structure rebuild failed, to determine whether you need to take action to prevent a subsequent rebuild failure.

- **Contact IBM**

If you are unable to resolve the problem, take the following actions:

- Copy the SYSLOG, including the D XCF , STRUCTURE , STRNAME=*strname* output from every LPAR.
- Dump all the CQS address spaces, including the rebuild master CQS address space. Message CQS0240I indicates the rebuild master name.
- Retain the CQS log records. The CQS log might contain important log records pertaining to data objects put on the structure, moved on the structure, or deleted from the structure. The CQS log might also contain important log records pertaining to rebuild, such as:
  - Rebuild begin log record (4301).
  - Rebuild end log record (4302).
  - Rebuild failed log record (4303).
  - Rebuild lost UOW list log record (4304).
  - Request log records (03xx, 07xx, 08xx, 0Bxx, 0Dxx).
- Retain the IMS log records.
- Create a structure dump if you suspect a rebuild hang. The structure dump might contain important information about structure locks.
- Call the IBM Software Support for help.

## CQS trace records

Analyze CQS trace records in a formatted dump to determine which function encountered an error, and whether a problem is environmental or internal.

### Trace tables

Trace record eye catchers in a formatted dump provide clues about which functions resulted in errors. You might be able to correct environmental problems immediately. Refer internal IBM problems to IBM with appropriate documentation, such as system console logs and dumps.

CQS trace records are written to one or more of the trace tables shown in the following table.

*Table 8. Trace tables that contain CQS trace records*

| Table name | Number of tables             | Table description                                    |
|------------|------------------------------|------------------------------------------------------|
| ERR        | 1                            | Errors                                               |
| CQS        | 1                            | CQS activity, including errors                       |
| INTF       | 1                            | CQS interface events                                 |
| OFLW       | 1 per structure (EMHQ, MSGQ) | Structure overflow events                            |
| SEVT       | 1 per structure (EMHQ, MSGQ) | Structure event activity                             |
| STR        | 1 per structure (EMHQ, MSGQ) | Client activity for this structure, including errors |



Each CQS trace record is 32 bytes long, except records in the SEVT and OFLW tables. Those tables use an expanded 64-byte format. In a standard 32-byte trace entry, the first byte is the trace code and the second byte is the trace subcode. Many trace records contain a structure ID that identifies which structure the trace record applies to: the MSGQ primary structure, the MSGQ overflow structure, the EMHQ primary structure, or the EMHQ overflow structure. Trace records that apply to a client request contain a client ID that identifies the client that issued the request. The last 8 bytes are the STCK time stamp of when the trace record was written. The mapping of the rest of the bytes in the trace record is unique to the trace code and subcode.

The expanded 64-byte format used by trace records in the SEVT and OFLW tables contains 16 words of trace data in the following format:

**Word 0**

Byte 0 contains the trace code of the event.

Byte 1 contains the trace subcode of the event.

Byte 2 contains data dependent on the type of event, typically the structure ID.

Byte 3 contains data dependent on the type of event, typically the client ID.

**Word 1 - word 12**

These 48 bytes contain trace data generated by the event. The exact content is dependent on the type of event.

**Word 13**

This word contains the ID of the event control block (ECB) of the task that wrote the trace record in the table.

**Word 14 - word 15**

These 8 bytes contain the time stamp of the event in STCK format.

CQS trace records are mapped by macros that use the naming convention CQSTRxxx, where xxx represents the function that is being traced. For example, CQSTRPUT maps trace records associated with the CQSPUT request. Trace record mapping is based upon the trace code and the trace subcode.

Find the CQS trace code in the following table to locate the CQS macro that maps the trace record. The following table shows the CQS trace codes, the macro that maps the trace code, and a description of the trace macro.

*Table 9. CQS trace codes and mapping macros*

| <b>Trace code</b> | <b>Macro</b> | <b>Description</b> |
|-------------------|--------------|--------------------|
| 3                 | CQSTRCON     | CQSCONN request    |
| 4                 | CQSTRDSC     | CQSDISC request    |
| 5                 | CQSTRSY      | CQSRSYNC request   |
| 6                 | CQSTRINF     | CQSINFRM request   |
| 7                 | CQSTRPUT     | CQSPUT request     |
| 8                 | CQSTRRD      | CQSREAD request    |
| 9                 | CQSTRBRW     | CQSBRWSE request   |
| 0A                | CQSTRUNL     | CQSUNLCK request   |
| 0B                | CQSTRMOV     | CQSMOVE request    |
| 0C                | CQSTRRCV     | CQSRECVR request   |
| 0D                | CQSTRDEL     | CQSDEL request     |
| E                 | CQSTRQRY     | CQSQUERY request   |
| 0F                | CQSTRCHK     | CQSCHKPT request   |

Table 9. CQS trace codes and mapping macros (continued)

| Trace code | Macro    | Description                                   |
|------------|----------|-----------------------------------------------|
| 10         | CQSTRSHT | CQSSHUT request                               |
| 11         | CQSTRUPD | CQSUPD request                                |
| 30         | CQSTRICQ | CQS initialization                            |
| 31         | CQSTRTCQ | CQS termination                               |
| 32         | CQSTRYCH | System checkpoint                             |
| 40         | CQSTRIST | Structure initialization                      |
| 41         | CQSTRSTS | Structure service                             |
| 42         | CQSTRTCH | Structure checkpoint                          |
| 43         | CQSTRRBL | Rebuild                                       |
| 44         | CQSTROFL | Overflow                                      |
| 45         | CQSTRSTE | Structure event                               |
| 50         | CQSTRLOG | Log services                                  |
| 51         | CQSTRTBL | Table services                                |
| 52         | CQSTRDYA | Dynamic allocation services                   |
| 53         | CQSTRDSS | Data set services                             |
| 54         | CQSTRDSP | Data space services                           |
| 55         | CQSTRLRR | Log record router                             |
| 56         | CQSTRXCF | z/OS cross-system coupling facility interface |
| 57         | CQSTRCMD | Command                                       |
| 60         | CQSTRSTT | Statistics                                    |
| 70         | CQSTRINT | CQS client interface                          |

Trace codes for CQS requests are defined in the CQSRQTYP macro. Trace codes for other CQS functions are defined in the CQSCODES macro. CQS trace records in a formatted dump might contain eye catchers that provide clues about which function encountered an error, such as "overflow," "rblld," "str chkpt," and "duplex."

CQS request trace records sometimes contain a return code, reason code, and completion code from the request. CQS request return codes, reason codes, and completion codes are mapped by macros that use the naming convention CQSRRxxx, where xxx represents the function that is being traced. For example, the macro CQSRRPUT maps return codes, reason codes, and completion codes that are associated with the CQSPUT request. The following table shows the macros that define the return codes, reason codes, and completion codes for CQS requests.

Table 10. CQS mapping macros and request trace records

| Macro    | CQS request macro for return codes, reason codes, and completion codes |
|----------|------------------------------------------------------------------------|
| CQSRRCON | CQSCONN                                                                |
| CQSRRDSC | CQSDISC                                                                |

Table 10. CQS mapping macros and request trace records (continued)

| Macro    | CQS request macro for return codes, reason codes, and completion codes |
|----------|------------------------------------------------------------------------|
| CQSRRRSY | CQSRSYNC                                                               |
| CQSRRINF | CQSINFRM                                                               |
| CQSRRPUT | CQSPUT                                                                 |
| CQSRRRD  | CQSREAD                                                                |
| CQSRRBRW | CQSBRWSE                                                               |
| CQSRRUNL | CQSUNLCK                                                               |
| CQSRRMOV | CQSMOVE                                                                |
| CQSRRRCV | CQSRECVR                                                               |
| CQSRRDEL | CQSDEL                                                                 |
| CQSRRQRY | CQSQUERY                                                               |
| CQSRRCHK | CQSCHKPT                                                               |
| CQSRRSHT | CQSSHUT                                                                |
| CQSRRUPD | CQSUPD                                                                 |

CQS trace records in formatted dumps contain eye catchers that identify the trace code and the trace subcode.

The following example shows a CQS trace record with eye catchers:

```
INFRM: INF DONE FOR Q      06090101 05E3F3F2 F7F0D3C1 40404040
                          40404040 05541160 AF975E81 59426906
```

The trace code is in the first byte (X'06'), which the CQSRQTY macro documents as the CQSINFRM request. The eye catcher is INFRM. The CQSTRINF macro maps the trace records for trace code X'06'.

The trace subcode is in the second byte (X'09'), which the CQSTRINF macro documents as "inform done for queue." The eye catcher is INF DONE FOR Q.

The CQSTRINF macro documents byte 3 for trace code X'06' as containing the structure ID (X'01'). Structure ID X'01' indicates the primary MSGQ structure.

The CQSTRINF macro documents byte 4 for trace subcode X'06' as containing the client ID (X'01'). Client ID X'01' represents the client that issued the CQSINFRM request. The CQSTRINF macro documents words 2, 3, 4, and 5 for trace subcode X'06' as containing the name of the queue for which the inform was done. This queue name is for queue type 05 (the IMS transaction queue). The queue name is T3270LA (X'E3F3F2F7F0D3C1').

The CQSTRINF macro documents word 6 for trace subcode X'06' as the ECB of the task that wrote this trace record (X'05541160').

The CQSTRINF macro documents words 7 and 8 as the STCK time of when the trace record was written.

## CQS log records

You can use Common Queue Server (CQS) log records to diagnose problems related to the CQS address space and generate various reports, such as statistics about the number of requests.

CQS writes records to the z/OS log stream that contains all CQS log records from all CQs that are connected to a structure pair. You can use the log records to:

- Diagnose problems related to the CQS address space.

For CQS internal errors, the IBM support representative will direct you to print the appropriate log records.

You can sometimes use information in the log records to set up a keyword string to search APAR descriptions and compare them to your own problem.

- Generate various reports related to the CQS address space, such as statistics about the number of requests.

By knowing the content and format of the log records, you can set up a DFSERA10 job to format and print the specific log records you want.

Each CQS log record contains a log record prefix, followed by data that is unique to the record. Macro CQSLGRFX maps the log record prefix.

You can view the CQS log record formats by assembling mapping macro CQSLGREC with TYPE=ALL.

Individual log record DSECTs can be obtained by assembling the ILOGREG macro while including a format statement for the desired log record.

Table 11. CQS log records

| Type  | Subtype | Mapping macro | Conditions for writing the log record                                                                                                    |
|-------|---------|---------------|------------------------------------------------------------------------------------------------------------------------------------------|
| X'03' | X'01'   | CQSLGCON      | CQSCONN request: The client connect to a structure completed.                                                                            |
| X'04' | X'01'   | CQSLGDSC      | CQSDISC request: The client disconnect from a structure completed.                                                                       |
| X'07' | X'01'   | CQSLGPUT      | CQSPUT OBJECT request completed.                                                                                                         |
|       | X'02'   |               | CQSPUT COMMIT request completed.                                                                                                         |
|       | X'03'   |               | CQSPUT START request completed.                                                                                                          |
|       | X'04'   |               | CQSPUT FORGET request completed.                                                                                                         |
|       | X'05'   |               | CQSPUT ABORT request completed.                                                                                                          |
|       | X'06'   |               | CQSPUT request failed.                                                                                                                   |
|       | X'07'   |               | CQSPUT system checkpoint record was written.                                                                                             |
|       | X'08'   |               | CQSPUT FORGET request completed. This is a batched log record.                                                                           |
| X'08' | X'01'   | CQSLGRD       | CQSREAD request completed.                                                                                                               |
|       | X'02'   |               | CQSREAD request failed.                                                                                                                  |
|       | X'03'   |               | CQSREAD system checkpoint record was written.                                                                                            |
|       |         | CQSLGCHD      | This system checkpoint header record is not a complete log record, but it is used in CQSLGPUT and CQSLGRD system checkpoint log records. |
| X'0B' | X'01'   | CQSLGMOV      | CQSMOVE or CQSUNLCK request completed.                                                                                                   |
|       | X'02'   |               | CQSMOVE or CQSUNLCK request failed.                                                                                                      |
|       | X'03'   |               | CQSMOVE or CQSUNLCK request moved an object between the primary and overflow structure.                                                  |
| X'0D' | X'01'   | CQSLGDEL      | CQSDEL request: Delete-type 1 (delete by token) completed.                                                                               |
|       | X'02'   |               | CQSDEL request: Delete-type 2 (delete by queue name) completed.                                                                          |
|       | X'03'   |               | CQSDEL request: Delete-type 3 (delete by queue name and UOW) completed.                                                                  |
|       | X'04'   |               | CQSDEL request: Delete-type 1 (delete by token) completed. This is a batched log record.                                                 |

Table 11. CQS log records (continued)

| Type  | Subtype | Mapping macro | Conditions for writing the log record                                                                                             |
|-------|---------|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
|       |         | CQSLGBHD      | This batched log record header record is not a complete log record, but is used in CQSLGPUT and CQSLGDEL batched log records.     |
| X'10' | X'01'   | CQSLGSHT      | CQSSHUT request completed.                                                                                                        |
| X'32' | X'01'   | CQSLGYCH      | System checkpoint started.                                                                                                        |
|       | X'02'   |               | System checkpoint ended.                                                                                                          |
|       | X'03'   |               | System checkpoint failed.                                                                                                         |
| X'40' | X'01'   | CQSLGIST      | Beginning of log stream.                                                                                                          |
| X'42' | X'01'   | CQSLGTCH      | Structure checkpoint started.                                                                                                     |
|       | X'02'   |               | Structure checkpoint ended.                                                                                                       |
|       | X'03'   |               | Structure checkpoint failed.                                                                                                      |
| X'43' | X'01'   | CQSLGRBL      | Structure rebuild started. Statistics about the old structure, the rebuild structure, and rebuild failure are mapped by CQSSSTT6. |
|       | X'02'   |               | Structure rebuild ended. Statistics about the old structure, the rebuild structure, and rebuild failure are mapped by CQSSSTT6.   |
|       | X'03'   |               | Structure rebuild failed. Statistics about the old structure, the rebuild structure, and rebuild failure are mapped by CQSSSTT6.  |
|       | X'04'   |               | Structure rebuild resulted in a lost UOW list. This record lists the lost UOWs.                                                   |
| X'44' | X'01'   | CQSLGOFL      | Overflow threshold began.                                                                                                         |
|       | X'02'   |               | Overflow threshold ended.                                                                                                         |
|       | X'03'   |               | Overflow threshold failed.                                                                                                        |
|       | X'04'   |               | Overflow mode ended.                                                                                                              |
|       | X'05'   |               | Overflow status change.                                                                                                           |
|       | X'06'   |               | Qnames were moved to overflow.                                                                                                    |
|       | X'07'   |               | Qnames were removed from overflow.                                                                                                |
|       | X'08'   |               | CQSOVERFLOWQNMNR, a control list entry containing the list of queue names deleted from overflow, was deleted.                     |
|       | X'09'   |               | Overflow Scan Begin.                                                                                                              |
|       | X'0A'   |               | Overflow Scan End.                                                                                                                |
|       | X'0B'   |               | Private Queue Scan Begin.                                                                                                         |
|       | X'0C'   |               | Structure to be deleted.                                                                                                          |

Table 11. CQS log records (continued)

| Type  | Subtype | Mapping macro | Conditions for writing the log record                                                                                                                              |
|-------|---------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'60' | X'01'   | CQSLGSTT      | Structure statistics were written at the end of system checkpoint. Individual statistics areas are mapped by CQSSSTT1, CQSSSTT2, CQSSSTT3, CQSSSTT4, and CQSSSTT5. |
|       | X'C0'   |               | Internal BPE service statistics were written at the end of system checkpoint.                                                                                      |

## Printing CQS log records

To print the CQS log records from the z/OS system log, use the IMS File Select and Formatting Print utility (DFSERA10) with exit routine CQSERA30.

### Example JCL to print CQS log records

The following example shows the required JCL to print the log records from a z/OS system log. This JCL causes the z/OS logger to invoke the default log stream subsystem exit routine, IXGSEXIT, to copy the log records. The exit routine returns a maximum of 32 760 bytes of data for each log record even though CQS supports larger log records. You can specify the name of a different exit routine, if necessary.

Use the following JCL to print the CQS log records:

```
//CQSERA10 JOB   MSGLEVEL=1,MSGCLASS=A,CLASS=K
//STEP1   EXEC  PGM=DFSERA10
//STEPLIB DD    DISP=SHR,DSN=IMS.SDFSRESL
//SYSPRINT DD   SYSOUT=A
//TRPUNCH DD   SYSOUT=A,DCB=BLKSIZE=80
//SYSUT1  DD    DSN=SYSLOG.MSGQ01.LOG,
//          SUBSYS=(LOGR,IXGSEXIT),
//          DCB=(BLKSIZE=32760)
//SYSIN   DD    *
CONTROL  CNTL H=EOF
OPTION   PRINT EXITR=CQSERA30
END
//
```

### DD statements

#### STEPLIB

DSN= points to IMS.SDFSRESL, which contains the IMS File Select and Formatting Print utility (DFSERA10).

#### SYSUT1

DSN= points to the CQS log stream name that was specified in the LOGNAME= parameter in the CQSSGxxx PROCLIB member.

### Control Statements

#### H=

Specifies the number of log records to print. H=EOF prints all log records.

#### EXITR=CQSERA30

The CQS log record routine that is called to format each log record. This routine prints the record type and time-stamp information for each record, and dumps the contents of the record (up to a maximum of 32 760 bytes (X'7FF8')).

### Limiting Log Data to a Specified Time Range

You can limit the log records you print to those in a particular interval of time by using the FROM and TO parameters on the SUBSYS statement. For example, the following DD card:

```
//SYSUT1  DD    DSN=SYSLOG.MSGQ01.LOG,
//          SUBSYS=(LOGR,IXGSEXIT,
```

```
//          'FROM=(2001/042,11:00:00),TO=(2001/042,12:00:00)',
//          DCB=(BLKSIZE=32760)
```

would pass log records only from 11:00 to 12:00 on day 42 of the year 2001 to the DFSERA10 program. Dates and times specified in this manner are in GMT, and the seconds field of the time values is optional. If you want to use local dates and times, add the LOCAL keyword to the statement:

```
//SYSUT1 DD DSN=SYSLOG.MSGQ01.LOG,
//          SUBSYS=(LOGR,IXGSEXIT,
//          'FROM=(2001/042,11:00:00),TO=(2001/042,12:00:00),LOCAL'),
//          DCB=(BLKSIZE=32760)
```

## Copying CQS log records for diagnostics

IBM Software Support sometimes requires a copy of a range of CQS log records for problem determination. You can use the IEBGENER utility program to copy some or all of the CQS log for a structure to a BSAM data set for sending to IBM Software Support.

### IEBGENER utility program example

The copy made by the IEBGENER utility is a binary image of the log records. The following JCL is a job that copies CQS log records between 15:10 and 15:30 local time on day 89 of 2001 to a data set named CQS.LOG.COPY:

```
//CQSCPYLG JOB MSGLEVEL=1,CLASS=K
//*****
//* THIS JOB COPIES A CQS LOG STREAM TO A DATASET (MAX 32K / RECORD) *
//*****
//STEP1 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN DD DUMMY
//SYSUT1 DD DSN=SYSLOG.MSGQ01.LOG,
//          SUBSYS=(LOGR,IXGSEXIT,
//          'FROM=(2001/089,15:10),TO=(2001/089,15:30),LOCAL'),
//          DCB=(BLKSIZE=32760)
//SYSUT2 DD DSN=CQS.LOG.COPY,
//          DISP=(NEW,KEEP,DELETE),
//          VOL=SER=EDSDMP,
//          SPACE=(CYL,(10,10)),
//          UNIT=SYSDA
```

If you copy CQS log records using the IEBGENER utility, the following guidelines apply:

- The copied records cannot be used by CQS in any way (such as restart or recovery). They are for diagnostic purposes only.
- CQS log records that are greater than 32 KB in length are truncated. The SUBSYS exit supports a maximum of a 32 KB record size.





## Chapter 7. CSL - Common Service Layer service aids

Common Service Layer (CSL) and Resource Manager (RM) trace records can help you analyze problems in CSL.

### Related tasks

[“Collecting data about CSL-related problems” on page 22](#)

The Common Service Layer address spaces, Open Database Manager (ODBM), Operations Manager, Structured Call Interface, and Resource Manager, produce SDUMPs for internal errors. The CSL dumps are in the SYS1.DUMP data sets.

### CSL trace records

You can analyze CSL address space trace records (for example OM, RM, or SCI) in a formatted dump to determine whether a problem is environmental or internal.

#### Trace records

Trace record eye catchers in a formatted dump provide clues about which function resulted in an error. You might be able to take action to correct environmental problems immediately. Refer internal problems to IBM with appropriate documentation, such as system console logs and dumps.

ODBM trace records are written to one or more of the trace tables shown in the following table.

*Table 12. Trace tables for ODBM trace records*

| Table name | Number of tables | Table description                  |
|------------|------------------|------------------------------------|
| CSL        | 1                | CSL activity, including errors     |
| ERR        | 1                | Errors                             |
| ODBM       | 1                | ODBM activity                      |
| PLEX       | 1 per IMSplex    | IMSplex activity, including errors |

OM trace records are written to one or more of the trace tables shown in the following table.

*Table 13. Trace tables for OM trace records*

| Table name | Number of tables | Table description                  |
|------------|------------------|------------------------------------|
| CSL        | 1                | CSL activity, including errors     |
| ERR        | 1                | Errors                             |
| OM         | 1                | OM activity                        |
| PLEX       | 1 per IMSplex    | IMSplex activity, including errors |

RM trace records are written to one or more of the trace tables shown in the following table.

*Table 14. Trace tables for RM trace records*

| Table name | Number of tables | Table description                            |
|------------|------------------|----------------------------------------------|
| CSL        | 1                | CSL activity, including errors               |
| ERR        | 1                | Errors                                       |
| PLEX       | 1 per IMSplex    | IMSplex activity, including errors           |
| REPO       | 1                | IMSRSC repository activity, including errors |

Table 14. Trace tables for RM trace records (continued)

| Table name | Number of tables | Table description             |
|------------|------------------|-------------------------------|
| RM         | 1                | RM activity, including errors |

SCI trace records are written to one or more of the trace tables shown in the following table.

Table 15. Trace tables for SCI trace records

| Table name | Number of tables | Table description                  |
|------------|------------------|------------------------------------|
| CSL        | 1                | CSL activity, including errors     |
| ERPL       | 1                | Parmlist errors                    |
| ERR        | 1                | Errors                             |
| INTF       | 1                | SCI interface activity             |
| INTP       | 1                | Interface parmlist                 |
| PLEX       | 1 per IMSplex    | IMSplex activity, including errors |
| SCI        | 1                | SCI activity, including errors     |

Each CSL trace record contains 32 bytes (the ERPL and INTP tables in the SCI address space contain records that are 256 bytes). The first byte is the trace code, which indicates the function that wrote the trace record. Examples of trace code functions include address space initialization, address space termination, the CSLMCMMD request, the CSLRMUPD request, and the CSLSCRQS request. The second byte is the trace subcode, which indicates the category of the trace record. Examples of trace subcode categories include begin request, end request, CQS error, and SCI error. Most trace records include a 2-byte module identifier of the module that wrote the trace record. The last 8 bytes are the STCK time stamp of when the trace record was written. Trace record mapping of the rest of the fields is unique to the trace subcode.

CSL address space trace codes and other common codes used in trace records are mapped by a macro following the naming convention of CSLxCODE macro, where x represents the CSL address space as shown in the following table.

Table 16. CSL address space trace code mapping macros

| Codes macro name | Description                                     |
|------------------|-------------------------------------------------|
| CSLDCODE         | ODBM codes                                      |
| CSLOCODE         | OM codes                                        |
| CSLRCODE         | RM codes                                        |
| CSLSCODE         | SCI codes                                       |
| CSLZCODE         | CSL codes common to multiple CSL address spaces |

CSL address space trace records are mapped by a macro following the naming convention of CSLxTRC macro, where x represents the CSL address space as shown in the following table.

Table 17. CSL address space trace record mapping macros

| Trace macro name | Description        |
|------------------|--------------------|
| CSLDTRC          | ODBM trace records |
| CSLOTRC          | OM trace records   |
| CSLRTRC          | RM trace records   |

Table 17. CSL address space trace record mapping macros (continued)

| Trace macro name | Description                                             |
|------------------|---------------------------------------------------------|
| CSLSTRC          | SCI trace records                                       |
| CSLZTRC          | CSL trace records common to multiple CSL address spaces |

Trace record mapping is based upon the trace subcode, which identifies the category of trace record. One particular trace subcode can apply to many trace codes. Each trace record mapping also includes a pictorial representation in a comment block. Use the trace subcode to locate the trace record mapping in the CSLXTRC macro. Some trace codes are unique to a particular CSL address space, others are common to more than one CSL address space.

The CSLxCODE macro includes 2-byte module identifier codes that are used in trace records and messages when it is necessary to identify a CSL module. The module identifier represents the module that wrote the trace record. Module identifier codes are defined as follows:

**CSL address spaces**

X'0001'-X'6FFF'

**CSLZ modules**

X'7000'-X'77FF'

**BPE modules**

X'7800'-X'7FFF'

**Not used**

X'8000'

**Reserved for BPE tracing**

X'8001'-X'FFFF'

CSL request trace records sometimes contain a return code, reason code, and completion code from the request. CSL request return codes, reason codes, and completion codes are mapped by macros following the naming convention CSLxRR, where x represents the CSL address space as shown in the following table. These macros are in the IMS.SDFSMAC data set.

Table 18. CSL request return, reason, and completion codes mapping macros

| Macro  | Description                                           |
|--------|-------------------------------------------------------|
| CSLDRR | ODBM return codes, reason codes, and completion codes |
| CSLORR | OM return codes, reason codes, and completion codes   |
| CSLRRR | RM return codes, reason codes, and completion codes   |
| CSLSRR | SCI return codes, reason codes, and completion codes  |

CSL trace records in formatted dumps contain eye catchers that identify the trace code, the trace subcode, and the module that wrote the trace record. The EPL and INTF trace tables in SCI contain parameter lists, tables, and other data areas that cross the SCI interface. These data areas are formatted in the SCI dump.

**Related concepts**

[Overview of the IMSRSC repository \(System Definition\)](#)

**Related reference**

[BPE configuration parameter member of the IMS PROCLIB data set \(System Definition\)](#)

## RM trace record example

---

An example of an RM trace record with eye catchers is described.

### RM trace record with eye catchers

```
CEVTX:*CQS SERVICE ERR RCQE 60110000 03000042 0000000C 00000304 00000008 0BC60C20 B6B1AF09 07C68F08
```

The trace code is in the first byte (X'60'), which the CSLRCODE macro documents as CQS Event Exit. The eye catcher for this is CEVTX. The trace subcode is in the second byte (X'11'), which the CSLRTRC macro documents as a miscellaneous CQS service error. The eye catcher for this is \*CQS SERVICE ERR. The asterisk at the beginning of the eye catcher indicates an error.

The CSLRTRC macro documents byte 5 for trace subcode X'11' as containing the service request X'03', which is the CQSCONN request.

The CSLRTRC macro documents byte 8 for trace subcode X'11' as containing the module ID X'0042', which the CSLRCODE macro defines as module CSLRCQE0. The module name is included in the eye catcher on RCQE. The CSLRTRC macro documents word 3 for trace subcode X'11' as containing the CQSCONN return code X'0000000C'. The CQSRRCON macro defines the CQSCONN return codes, reason codes, and completion codes. The CQSRRCON macro defines return code X'0000000C' as a list error.

The CSLRTRC macro documents word 4 for trace subcode X'11' as containing the CQSCONN reason code X'00000304'. The CQSRRCON macro defines reason code X'00000304' as no requests successful.

The CSLRTRC macro documents word 5 for trace subcode X'11' as containing the CQSCONN completion code X'00000008'. CQSRRCON macro defines completion code X'00000008' as no resource structure is defined. RM was unable to connect to the resource structure because it is not defined. This is probably an environmental problem where the resource structure was not correctly defined to CQS.

The CSLRTRC macro documents word 6 for trace subcode X'11' as containing the ECB address (X'0BC60C20').

---

## Chapter 8. DB - Database service aids

You can use service aids, such as the IMS test program (DFSDDLTO), as well as various diagnostic techniques, to analyze problems with IMS databases.

### Job control block trace

---

The job control block (JCB) trace is one of most useful diagnosis tools for any application problem that might occur. The trace is an easy way to determine the last five calls that were issued, and what their return codes were.

#### Analyzing the JCB trace

Analyzing the JCB trace is a good way to identify application problems. For example, sometimes the application programmer forgets to handle a certain status code, even though it identifies an error situation. Seeing the call and its return code draws attention to this application error and makes it easier to resolve.

The JCB trace is always on (you do not need to do anything to turn it on), and is included in every IMS dump. The job control block portion of the dump is formatted under the heading, JCB. The JCB trace is a wrap-around area that consists of six 2-byte entries. The first entry begins at the offset of JCBTRACE in the JCB portion of the dump and is followed immediately by the remaining five entries. As the entries are inserted into the trace area, previous entries are shifted left.

In the first through fifth entries, the first byte identifies the DL/I call. The second byte in these entries contains the second character of the DL/I I/O status code (return code). The sixth entry contains information about the call that immediately preceded the call that was being processed when the abend occurred; this information can be useful in determining what occurred prior to the failure. The function of that prior call is identified in field JCBPREVF of the JCB, and the status code of the prior call is in field JCBPREVR.

If one of the 2-byte fields in the JCB trace contains X'0000', no call was made.

#### Example JCB trace

The JCB trace might contain the following six fields:

```
0000 0000 0205 0305 0140 0140
```

This trace indicates that only four calls were made, the most recent of which was a get-unique call (either GU or GHU), as indicated by the first-byte code of X'01'. The status code for the most recent call was X'40'.

#### Related concepts

[“Dump analysis introduction” on page 156](#)

In a pseudoabend supervisor call (SVC) dump that is generated by module DFSERA20, you can find the failing program specification table (PST) by searching the save areas for the caller of module DFSERA20. In the save area flow, DFSERA20 is called INTERA20 and register 1 contains the failing PST address.

#### Sample JCB trace

A sample JCB trace is shown.

#### JCB dump example

The following table shows an example of a JCB dump.

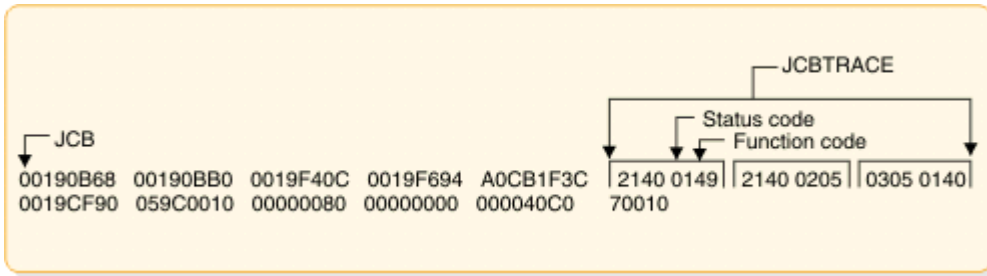


Figure 60. Example of a JCB dump

## JCB trace call function codes

DL/I user calls are listed, including codes and calls.

### DL/I user call encoded functions

The following table shows the DL/I user call encoded functions, which are contained in DFSDLA00, at label FUNCSTRT.

Table 19. DL/I user call encoded functions

| Code | Call         | Code | Call               |
|------|--------------|------|--------------------|
| 00   | GB           | 65   | LOG                |
| 00   | GBT          | 70   | RELOAD             |
| 00   | GHB          | 80   | OPEN               |
| 00   | GHBT         | 81   | CLOSE              |
| 00   | GHP          | 82   | STOP               |
| 00   | GL           | 83   | CHANGE             |
| 00   | GND          | 84   | SNAP               |
| 00   | GNX          | 85   | CHECK POINT        |
| 00   | GP           | 86   | STATISTICS REQUEST |
| 01   | GHU          | 87   | CMD                |
| 01   | GU           | 88   | GCMD               |
| 03   | GHN          | 89   | ROLB               |
| 03   | GN           | 90   | PURGE              |
| 04   | GHNP         | A0   | UNLD               |
| 04   | GNP          | A1   | GSCD               |
| 20   | DLET or REPL | A2   | MOVE               |
| 21   | REPL         | B0   | SPND               |
| 22   | DLET         | F1   | XSET               |
| 23   | DLET or REPL | F2   | XRUN               |
| 40   | ISRT         | F3   | XFIN               |
| 41   | ISRT         | F4   | XSCD               |
| 42   | ASRT         | F5   | XOFF               |

---

Table 19. DL/I user call encoded functions (continued)

---

| Code | Call | Code | Call |
|------|------|------|------|
| 60   | DEQ  |      |      |

---

## DL/I test program - DFSDDLT0

---

The DL/I test program is an IMS application that issues calls to DL/I based on control statement information. For diagnostic purposes, this allows you a means of separating the application logic from DL/I logic to resolve problems.

Optionally, the DL/I test program compares the results of the calls with expected results provided in control statements. If the returned results do not match the expected results, the program can provide a SNAP of any combination of DL/I blocks, I/O buffer pool, subpools 0-127, and the entire region. The test program can also invoke the IMS SNAP call, by means of its control statements, during normal execution to provide diagnostic information on the DL/I calls that are executing correctly.

## COMPARE statement SNAPs

---

When a DL/I call does not produce the results you expect, you can use the COMPARE statement to compare the actual results of a call with the expected results. The normal output of this statement usually provides enough information to determine what is causing the problem.

When the output from a COMPARE statement does not provide enough information, you can use the SNAP option of the COMPARE statement to obtain additional diagnostic information. Specifically, the I/O buffer pool and the DL/I blocks are dumped. You can use the generated diagnostic output, in conjunction with *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes* to determine the cause of the user abend you are diagnosing.



**Attention:** The COMPARE SNAP statement is a call to DL/I. Therefore, when a SNAP option is issued, some data in the captured area might be changed as a result. To prevent inadvertent change to data that is not involved in the problem, use a COMPARE SNAP statement only for the specific data that is involved in the problem.

Some control blocks are always dumped. Others are dumped only when you request them in the SNAP options.

The following control blocks are always dumped:

- The SCD
- The PST (save areas related to the current DL/I task are a part of the PST)
- The Retrieve trace area

The following SNAP option requests dump the control blocks or buffers listed:

- A request for the buffer pool dumps:
  - OSAM buffer pool prefix and buffer pool, if present
  - VSAM subpool prefix and buffer prefix and subpools
  - Header for the DL/I, dispatcher, scheduler, and latch trace tables
  - The DL/I trace table
  - The dispatcher trace table
  - The scheduler trace table
  - The latch trace table
  - Hierarchical direct (HD) trace table, if present
  - Sequential buffering control blocks and buffer pools, if present
- A request for the current DB PCB or all PSB-related control block dumps:

- Delete/replace work areas, when allocated
- ENQ/DEQ trace table, if present
- PSB and PSB work areas
- PCB information, including JCB, DSGs, and level table
- The block of SDBs, SDB expansion blocks, and generated SDBs
- DMB directories
- DMBs for the current PSB
- PNTs associated with partition DMBs

If you also requested buffers, a request for the current DB PCB or all PSB-related control block dumps:

- Any HISAM/QSAM buffers
  - Any VSAM LRECs for each qualifying DSG
- A request for the entire region, or subpools 0-127, dumps the entire region or the subpools.

A SNAP of the entire region or subpools is sent to a SNAP data set.

If the SNAP destination is the IMS log, the request is changed to a SNAP of all control blocks, regardless of other option specifications.

A region or subpool SNAP, when requested, appears before any additional SNAPs that were requested.

If the destination of the SNAP is the IMS log, you can select and format these records (type X'67FD') from the log by using the File Select and Formatting Print utility (DFSERA10) with formatting exit routine DFSERA30.

## SNAPs on exceptional conditions

---

IMS produces SNAPs of DL/I control blocks on the IMS log (or the CICS system log).

The SNAP call facility identifies calling routines that generate snap dumps. Supervisor call (SVC) dumps are generated only for the intended abend codes or status codes, and for unknown calling routines.

IMS produces SNAPs of DL/I control blocks on the IMS log (or the CICS system log) in the following exceptional situations:

- A pseudoabend condition is encountered in a DL/I module.
- A system or user abend occurs for either a message region or a batch message region.

Control block SNAPs are produced in the same format as those produced by a DL/I SNAP call specifying ALL or YYY as SNAP options.

The SNAP IMS log records are record type X'67', subrecord type X'FF'. You can select these log records from the IMS log with the File Select and Formatting Print utility (DFSERA10). You can format output selected from the log with the formatting edit routine DFSERA30.

Internal IMS functions can request the snapping of specific virtual storage areas by issuing a SNAP Specific call to DFSERA20.

The following IMS functions request or use the SNAP Specific facility:

- SBSNAP option, on completion of calls from IMS modules to the Sequential Buffering buffer handler
- SBESNAP option, during SB evaluation
- SB COMPARE option, when detecting a mismatch between the buffer content that the SB buffer handler was returning to the OSAM buffer handler and the content of the database block as it is stored on DASD

For IMS online regions and CICS, these SNAPs are written to the IMS log. For IMS batch regions, these SNAPs can be written to either the log or to a data set specified on another DD statement.

When written to the log, the IMS log records have a record type X'67' and a subrecord type X'E'. The value of the low-order half-byte of the subrecord type depends on the IMS function that requests the SNAP. The subrecord types are:



**X'ED'**

SBESNAP option

**X'EE'**

SBSNAP option

**X'EF'**

SB COMPARE option

The formatting edit routine DFSERA30 can format output selected from the log.

**Related reference**

[“Printing log records and trace table entries” on page 558](#)

You can use the File Select and Formatting Print utility (DFSERA10) to print both log records from the IMS log data set and the externalized trace table entries that are recorded in the DFSTRAx data set.

[“Sequential buffering service aids” on page 220](#)

When you receive a message or abend that indicates a problem with sequential buffering (SB), several diagnostic tools are available. Some of these tools are useful for diagnosing other IMS database-related problems.

## DL/I call image capture

---

DL/I call image capture (module DFSDLTR0) enables you to trace and record all DL/I calls issued by an application program. The trace output is in a format acceptable as input to the DL/I test program DFSDDLTO.

DL/I call image capture is a useful debugging tool because it allows you to rerun an application program and generate the DL/I calls necessary to duplicate the condition that caused the program failure. This run provides you with documentation to assist you in problem determination.

You can run the trace in either a batch or DB/DC environment.

**Related tasks**

[“DL/I call image capture program” on page 215](#)

The DFSDLTR0 program, which operates independently, traces and records all DL/I calls issued by an application or multiple applications. The output is in a format acceptable as input to the DL/I test program DFSDDLTO.

**Batch environment**

In a batch environment, you start DL/I call image capture using the DLITRACE control statement in the DFSVSAMP DD data set.

The control statement allows you to trace either all DL/I calls issued by an application program or a range of calls. The traced information can be put in a sequential data set, the IMS log data set, or into both concurrently.

**Online environment**

In a DB/DC, DCCTL, or DBCTL environment, you start and terminate DL/I call image capture by issuing the /TRACE command from the master terminal (DB/DC and DCCTL only) or from the system console.

For example, to trace full-function database calls for a named PSB and send the output to an external data set, issue the following command:

```
/TRACE SET ON PSB psbname OPTION LOG
```

**How to retrieve DL/I call image capture data from the log data set**

If trace data is sent to the IMS log data set, you can retrieve it using the File Select and Formatting Print utility (DFSERA10) and the DL/I call image capture exit DFSERA50.

To use DFSERA50, you need to insert a DD statement defining the output data set in the DFSERA10 input stream. The default ddname for this DD statement is TRCPUNCH. The statement must specify LRECL=80.

## DL/I analysis

---

Debugging suggestions for a batch environment, including DL/I and DBB regions are described.

These debugging suggestions are useful in a batch environment. The information is valid for DL/I or DBB regions.

Before diagnosing abends in a batch region, review the external conditions. Verify that your environment is correct by asking the following questions:

- Are the JOBLIB/STEPLIB DD statements pointing to the correct libraries?
- Are the PSBLIBs and DBDLIBs at the same level as the JOBLIB/STEPLIB modules?
- If running with an ACBLIB, was the ACBGEN run under the same level of IMS you are currently running on?
- Were the databases correctly allocated and intact before starting the current run?

### Related tasks

[“Locating database-related traces” on page 160](#)

Locating Retrieve trace, JCBTRACE, DL/I trace and LOG data set are shown.

## IMS abends

User abends and system abends are discussed.

In general, abend dumps have two causes:

- An abend issued by an IMS module (user abend)
- A program check within an IMS module (system abend)

All IMS abends are issued with the dump option.

### User abends

There are two methods by which an IMS module can issue an abend when an error condition is detected.

- The first method is the standard ABEND macro issued by the code at the point of error detection. With this method, the PSW, at entry to the abend, points at the code within the module that both detected the error and issued the abend.
- With the second method, the module that detects the error does not issue the abend, but instead passes the error indication back to the program request handler, which then issues a real abend. The PSW, at entry to the abend, now points to the program request handler rather than to the module that detected the error. The pseudoabend method is used by DL/I modules that abend an application program in a dependent region but do not abend the IMS control region in a DB/DC environment.

When the DL/I test program is used as the application program, the pseudoabend is passed back to the test program rather than to the program request handler. This allows the test program to request a formatted SNAP rather than only an abend dump.

## Dump analysis introduction

In a pseudoabend supervisor call (SVC) dump that is generated by module DFSERA20, you can find the failing program specification table (PST) by searching the save areas for the caller of module DFSERA20. In the save area flow, DFSERA20 is called INTERA20 and register 1 contains the failing PST address.

The SNAP call facility identifies calling routines that generate snap dumps. SVC dumps are generated only for the intended abend codes or status codes, and for unknown calling routines.

The following list provides general considerations for dump analysis:

- The first request block (RB) on the RB chain represents the IMS batch region controller (DFSRR00). The second RB on the RB chain represents the batch program controller (DFSPCC30). Module DFSPCC30 always links to the application program that is named in the parameter field of the EXEC statement. Therefore, the application program must be represented by the third RB. However, if the

application program uses an IMS service, and that service abends, the third RB points to the offending IMS routine.

- The last two SVRBs represent ABEND and ABDUMP. The register contents at the time of abend are usually found in the first abend SVRB. The IMS STAE work area (DFSFSWA0) and the RTM work area in z/OS are also used to hold the register contents at abend time.
- There are two PSTs in a batch environment. One is used for all application calls and the second is used for background write whenever it is activated.
- Each PST has a 20-level save area set as part of the PST. When the abend occurs, ABDUMP prints the save areas that are associated with the active PST.
- At abend time, the IMS STAE routine gets control to flush the database buffers and close the log data set. It builds six additional save areas and chains them to the last save area in the active PST. The IMS STAE routine is partially contained within module DFSPCC30 and has an entry ID starting with the characters PCE.
- Most IMS modules use register 12 as a base register.

### Related concepts

[“Job control block trace” on page 151](#)

The job control block (JCB) trace is one of most useful diagnosis tools for any application problem that might occur. The trace is an easy way to determine the last five calls that were issued, and what their return codes were.

[“DL/I trace formats” on page 163](#)

The figures in this section show the formats of the most commonly used DL/I trace entries. The figures are included to help you understand the DL/I trace entries in order to communicate more effectively with IBM Software Support representatives and to build a valid search argument.

### Related reference

[“HDAM, HIDAM, PHDAM, or PHIDAM database” on page 126](#)

HDAM, HIDAM, PHDAM, and PHIDAM databases share the following record format.

## Dump analysis - detailed

To thoroughly analyze a dump, you need to understand the save area, DL/I call sequence, and the buffer handler request sequence. This section discusses each of these elements.

### Save areas

A DL/I call passes from the application program to the DL/I language interface (DFSLI000), to the program request handler (DFSPR000), to the batch nucleus (DFSBNUC0), and then to the DL/I call analyzer (DFSDLA00).

If everything works properly, the save area trace shows the contents of the registers at entry to the application program, the program request handler, and the DL/I analyzer. The DL/I analyzer passes the first save area in the PST to a DL/I module. This PST save area is the first save area below the save area that holds the contents of the registers at entry to the DL/I analyzer.

The contents of register 1 at entry to the DL/I analyzer is a pointer to the PST. This is the only register passed to the analyzer (the user call list pointer is passed to the analyzer in PSTIQPRM).

If the abend is a program check or an inline abend, the save area trace always gives a true indication of the flow of control between DL/I modules and the current depth of save area set usage. Most DL/I modules or X'01' with the low-order byte of register 14 on return to a higher-level module.

If the abend is a pseudoabend, the save areas below the analyzer might have been reused and therefore would not reflect the conditions at the time the abend condition was detected; for example, the DB Monitor might have been called by the analyzer.

**Note:** When pseudoabends are detected by some modules, the registers 14 to 12 at error, are stored at PSTSAVL+12. The high order byte in PSTSAVL+12 will contain a one-byte code for the module detecting the error. Here are the modules which will save registers and their corresponding codes in PSTSAVL+12:

**X'AA'**  
 DFSDLR00

**X'BB'**  
 DFSDDL00

**X'CC'**  
 DFSDLR00

**X'DD'**  
 DFSDXMT0

**X'EE'**  
 DFSURGU0

**X'FF'**  
 DFSRCHB0

Here is an example from the formatted PST of an abend U0853:

```
WD1 00000000 HSA 202C6BC8 LSA 2CD73B08 RET AA049128 EPA 30B02F40 R0 30000355
R1 212AD040 R2 2CD78790 R3 2FB6F5B4 R4 8004911E R5 2FB6FA8C R6 01410254
R7 21748060 R8 2FB6F82C R9 00000002 R10 30B053C0 R11 000401E0 R12 00047DC0
```

Since "RET" (PSTSAVL+12) contains X'AA', module DFSDLR00 detected this pseudoabend.

### DL/I call sequence

You can determine the current DL/I call and the sequence of calls leading up to the failure by scanning the DL/I trace table. Find the last entry made in the trace table by using the current entry pointer and then scanning backward in the table for the last entry made by the DL/I analyzer (entry code AA). This entry represents the current DL/I call.

You can determine the call sequence by continuing the backward scan, noting each entry made by the analyzer. Along with the call function, the analyzer also records the PCB address that was passed in the user's call list.

### Buffer handler request sequence

The buffer handler router traces each request to the buffer handler from a DL/I module. When the router receives the request, it passes the request to the OSAM buffer handler or the VSAM interface module. When the call is complete, control returns to the router. The router obtains the next available trace table entry and stores information describing the input and output for the buffer handler call.

By looking at all buffer handler entries between two DL/I analyzer DFSDLA00 entries (two specific DL/I calls), you can determine all requests made to the buffer handler to satisfy any specific DL/I call. A typical request to the buffer handler is a GET by relative byte address from the retrieve module. The entry made for this GET by relative byte address has a function code of E2, the RBA requested, and, if the request was satisfied (return code 0), the address of the segment read into the buffer pool.

## Generalized DL/I problem analysis

One method of problem analysis is discussed. Not all DL/I abends can be diagnosed using this sequence, but you can use the steps as a guide to DL/I debugging. All numbers are in hexadecimal.

1. The following approaches are valid if the IMS dependent region subtask appears in the dump.
  - Look at the user's call list for the current or last call. PSTIQPRM points to the call list. For all dependent region types, if the reentrant DL/I language interface, DFSLI000, is used, the user's call list address can be found in the contents of register 1 in the save area set at entry point to DFSPROX0-115 from the save area trace.
  - To find the last call parameters in a MPP or BMP dump, locate module DFSFSWA0 in the dump. Scan this module for ECP. At offset X'104' from ECP is a pointer to the parameters that made the last call to DL/I.

- To find the PCBs in an MPP or BMP dump, find DIRCA in module DFSFSWA0. The word immediately following DIRCA contains the address of an area of storage obtained by the GETMAIN macro instruction. This area contains the PCB list and all non-GSAM PCBs. The format of this area is:
    - At offset X'14' is the beginning of the PCB list passed to the program.
    - Immediately following the end of the PCB list is a copy of the I/O PCB, if one exists.
    - The next PCB (and subsequent PCBs) follow the end of the I/O PCB.
  - Because they exist elsewhere in the dump, GSAM PCBs are not copied here. The pointers to the GSAM PCBs can be found in the PCB list at offset X'14.'
2. If the abend occurred after the DL/I analyzer received the call, but before the application program got control back, the last call entry (code AA) in the DL/I trace table matches the current call. Use the technique described in [“DL/I call sequence”](#) on page 158 to determine the call sequence as far back as possible, noting the PCB address associated with each call.
  3. Compare the contents of PSTDBPCB to the PCB address in the last call entry in the trace table. If they are different, index maintenance is probably in control using its PCB within the PSB. Check the save area trace to verify this.
  4. Find the current PCB from the address in the trace table, and then find the JCB. Starting at label JCBTRACE in the JCB are six 2-byte trace entries for the last six calls issued against this PCB. The oldest entry is at the beginning and the newest entry is at the end of JCBTRACE. The first byte of an entry is the encoded call function and the second byte is the last half of the status code for that call. For example, an 0140 is an entry for a GET UNIQUE call that resulted in a blank status code. This trace is maintained by the DL/I analyzer at the completion of the call.
  5. Look at the contents of JCBLEV1C. If the call is a get or an insert, the retrieve module zeros this word at entry and then stores a pointer to each level table entry when it completes the call for that particular level. If the word is zero, retrieve is still trying to satisfy the call at the root level. Generally, JDBLEV1C reflects the lowest level satisfied during the current or last get or insert call.
  6. Check each level table entry to see if it holds a valid current position. Valid position is indicated by the absence of the empty bit in FLAG1 (LEVEMPTY in LEVF1, bit 1 byte 1). If this bit is off (valid position), LEVSDB points to the SDB currently in use or the last one used for this level. At the same time, LEVTTR, which contains either a relative byte address (RBA) or a relative record number (RRN), should match the current position saved in the SDB (SDBPOSC). In addition, if the database is HISAM, LEVSEGOFF matches SDBPOSN. This is the offset into the current relative record number.
  7. Look at the key feedback area—level table position. The key feedback area contains the fully concatenated key of the segment currently positioned on. If a level table entry contains a valid position, the contents of the key feedback area for that level is the key (if any) of the segment whose SDB is pointed to by LEVSDB and whose database position is contained within LEVTTR and LEVSEGOFF. The contents of the key feedback area are never cleared or blanked out. Therefore, unless the level table entry indicates it has a valid position, the residue in the key feedback area might not be meaningful.
  8. Map the database structure involved in the failure. Starting with the root SDB, which you can find with a pointer in the JCB (JCBSDB1), take each SDB in the sequence it is found in the dump and examine the field SDBPARA. This field is a pointer to the parent SDB (the root SDB points at the PCB). Map the structure according to SDBPARA; the result should match the logical structure defined at PSBGEN time. When mapping the structure, note the contents of SDBTARG. If this field is nonzero, the segment is involved in either logical relationships or indexing. The code in the high-order byte indicates which is the case.
  9. Use the DL/I trace table to analyze the sequence of buffer handler calls. The buffer handler trace is the most useful debugging tool for DL/I. The trace is available in both batch and DB/DC environments, and the entries are identical
    - Get calls are the most common, so this section uses a get call as an example. In an attempt to satisfy a get call, the retrieve module must examine a segment or a series of segments to see if it meets the call requirements. All segments must be requested from the buffer handler and the request must be in the form of an RBA, RRN, or a specific key request.

- The most common request from retrieve to the buffer handler is a byte locate. The parameters passed to the buffer handler are the function (byte locate), the RBA requested, and the data set in which the RBA exists. At exit to the buffer handler router, the next available trace entry is obtained and the code of the function requested is stored in the first byte. The buffer handler function codes are listed in the PST DSECT under PSTFNCTN. The byte locate function code is E2. The second byte of the trace entry is the relative PST number responsible for the request, which in batch is always an 01.
- Along with the function code, the DSG and RBA are placed into the entry. When the call to the buffer handler (OSAM or VSAM) is completed, the results are traced, again by the buffer handler router. The return code is stored in the third byte. The return codes are listed in the PST DSECT under PSTRTCDE. If the call is successful, the address of the segment within the buffer pool is stored at displacement C. This trace now shows each segment (RBA) requested by retrieve; by examining the buffer pools the contents of the segments and their prefixes can be seen. RBAs found in the trace table can be compared to position fields in the SDB and level table to accurately re-create the get call.

## Locating database-related traces

---

Locating Retrieve trace, JCBTRACE, DL/I trace and LOG data set are shown.

The following figure shows how to locate the following traces:

- Retrieve trace—records the flow through the retrieve module subroutines.
- JCBTRACE—traces the status of the prior six calls.
- DL/I trace—shows calls made to the call analyzer, buffer handler, and hierarchic direct space management, as well as information on Delete/Replace.
- LOG data set—records database changes, before and after images.

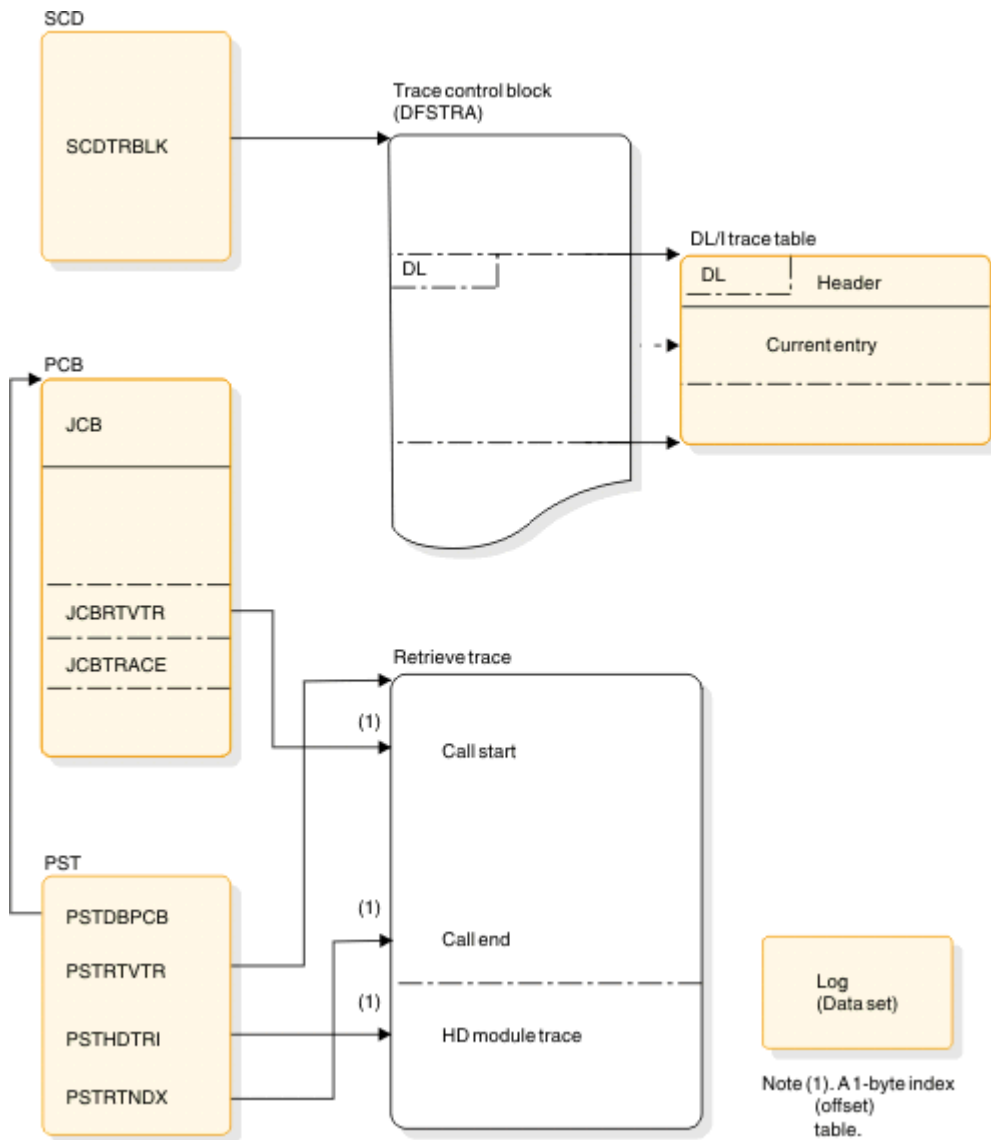


Figure 61. How to locate the database traces

### Related concepts

“DL/I analysis” on page 156

Debugging suggestions for a batch environment, including DL/I and DBB regions are described.

## DL/I trace

The DL/I trace table is a combined trace consisting of entries from DL/I calls, the DL/I buffer handler, DL/I OPEN/CLOSE, HD space management, lock activity (using PI or IRLM), OSAM, DFP interface, HALDB OLR trace, and ABENDU0427.

IMS always sets the DL/I and lock trace on at initialization except for batch, for which the default for traces is off. The trace level is set to high and it is written in memory.

The DL/I trace and the DL/I Call Image trace are different traces. The DLITRACE statement in IMS.PROCLIB member DFSVSMxx sets the DL/I Call Image trace on, the DL/I trace does not.

If the trace was written to the log, you can use the File Select and Formatting Print utility (DFSERA10) with an exit routine (DFSERA40 or DFSERA60).

- The Knowledge-Based Log Analysis (KBLA) panel interface.
- The File Select and Formatting Print utility (DFSERA10) with an exit routine (DFSERA40 or DFSERA60).

## Related reference

[“Type-1 trace table interface” on page 620](#)

For each trace, you can learn about the trace identifier, the events that are traced, and, if the trace is documented in this information, the topic where you can find more information. You use the trace identifier as an eye catcher to locate a trace in a dump.

[“X'D4': database tracker trace entries \(D4\)” on page 467](#)

The following table shows the database tracking trace entries for the X'D4' trace entry.

[“Sequential buffering service aids” on page 220](#)

When you receive a message or abend that indicates a problem with sequential buffering (SB), several diagnostic tools are available. Some of these tools are useful for diagnosing other IMS database-related problems.

## Using the DL/I trace facility

The DL/I trace facility is an important diagnostic tool that can help you determine the cause of a problem. Frequently, a problem occurs as a result of the interaction between two separate tasks. Interpreting the DL/I trace entries can be the best way of determining what each task was doing, and when.

### Example for using the DL/I trace facility

An IMS Fast Path application receives an abend 1027, and the user reports the problem to the support staff. Some of the steps the diagnostician might take are:

1. Find the abend code in *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*. This information indicates that the return code is in register 15.
2. Register 15 in the dump contains a value of X'0D.'

*IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes* indicates that this return code indicates that an enqueue or dequeue call was issued by module DBFBENQ0, and the return code from DFSLRH00 was X'12,' which indicates an invalid call.

3. Look at the DL/I trace to determine what resource was involved (if the DL/I trace was on at the time of the abend). If the DL/I trace was not on, it might be necessary to create the problem again with the DL/I trace facility on.

The list of trace entry IDs in [“DL/I trace formats” on page 163](#) indicates that one of the trace entries is “Exclusive control ENQ/DEQ PI trace entry” ([“The X'CA' trace entry for Fast Path calls” on page 176](#)). This is a good place to start the DL/I trace analysis.

What you learn from the DL/I trace might help you to:

- Identify and resolve an application error.
- Review APAR descriptions to see if this problem has occurred previously.
- Report the problem to IBM Software Support.

### Related concepts

[“DL/I trace formats” on page 163](#)

The figures in this section show the formats of the most commonly used DL/I trace entries. The figures are included to help you understand the DL/I trace entries in order to communicate more effectively with IBM Software Support representatives and to build a valid search argument.

### Related reference

[“X'C4' trace entry” on page 171](#)



The X'C4' trace entry is shown.

## DL/I trace formats

The figures in this section show the formats of the most commonly used DL/I trace entries. The figures are included to help you understand the DL/I trace entries in order to communicate more effectively with IBM Software Support representatives and to build a valid search argument.

**Exception:** Not every trace entry is shown. You can obtain the entries that are not described by assembling IDLIVSAM TRACENT from IMS.SDFSMAC.

### Related concepts

[“Dump analysis introduction” on page 156](#)

In a pseudoabend supervisor call (SVC) dump that is generated by module DFSERA20, you can find the failing program specification table (PST) by searching the save areas for the caller of module DFSERA20. In the save area flow, DFSERA20 is called INTERA20 and register 1 contains the failing PST address.

[“Using the DL/I trace facility” on page 162](#)

The DL/I trace facility is an important diagnostic tool that can help you determine the cause of a problem. Frequently, a problem occurs as a result of the interaction between two separate tasks. Interpreting the DL/I trace entries can be the best way of determining what each task was doing, and when.

### Related tasks

[“Program isolation trace” on page 214](#)

The program isolation (PI) trace traces all calls to the IMS enqueue/dequeue module (DFSFXC10) and writes the trace entries to the system log as type X'67FA' records.

### X'0C' trace entry

The X'0C' trace entry is shown.

#### TRACE ID = X'0C'

```
word 0 - byte 1 - X'0C' - DL/I OPEN/CLOSE trace entry for each
           data set. This entry shows a successful OPEN/CLOSE.
           For an error during OPEN/CLOSE, the data in ENTRY6 and
           ENTRY7, X'18' and X'1C' respectively, is shown in the
           "error condition"
           byte 2 - PST number
           bytes 3-4 - Trace sequence number description.
word 1 - byte 1 - PSTFNCTN (See note below)
           bytes 2-3 - DMB number
           byte 4 - DCB number
word 2 - DCB address
word 3 - DD name
word 4 - DD name
word 5 - PSTDBPCB - database PCB address
word 6 - DMB address (Error condition) - Offset in DFSDLOC0 where error was
           detected.
word 7 - bytes 1-3 - PSTPSB-PSB address - database PCB address (Error
           condition) - Word "LKER" or reason codes described in
           message DFS07301
           byte 4 - Not used
```

### X'31', X'32', X'34', X'B1', and X'B2' trace entries

The X'31', X'32', X'34', X'B1', and X'B2' trace entries are shown.

#### Example of X'31', X'32', X'34', X'B1', and X'B2' trace entries

#### TRACE ID = X'31', X'32', X'34', X'B1', X'B2'

```
word 0 - byte 1 - X'31', X'32', X'34', X'B1', or X'B2' - Function code for
           HD space management (see note 1 below)
           byte 2 - PST number
           bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - Length of request (see note 3 below)
           bytes 3-4 - Offset (requested or returned)
word 2 - byte 1 - PSTTRNID (ID of module calling space management)
           byte 2 - PSTTRMSC (subcode of module calling the buffer handler -
```

```

        see note 4 below)
        byte 3 - Not used
        byte 4 - PSTRTCDE (return code from space management)
word 3 - byte 1 - Flag byte (X'80' - entry already in use)
        bytes 2-4 - PSTDATA (core address - see note 5 below)
word 4 - PSTBYTNM (RBA or RRN - see note 6 below)
word 5 - RBA of space given to caller
word 6 - bytes 1-2 - DMB number
        byte 3 - DCB number
        byte 4 - Reserved
word 7 - MSG/ABEND feedback

```

### Notes:

1. You need the X'32' entries to resolve this problem.
2. Numbers 3 and 4 are very important. In most cases, the segment was deleted by another task (see PST number), and this task (see PST number) tried to enqueue on the segment that waited while the other PST finished its processing. During the attempt, an FSE was found and abend U0832 resulted. An IMS internal error usually causes this problem.
3. The length of the segment that was freed.
4. The real storage address of the segment during the time of deletion.
5. The PSTBYTNM is the key field in the trace table. Look for a X'32' entry with the PSTBYTNM field equal to the PSTBYTNM field found in the buffer trace.

### X'60' trace entry

The X'60' trace entry is shown.

#### The X'60' trace entry

```

TRACE ID   = X'60'

word 0     - byte 1 - X'60' OSAM START I/O
            byte 2 - Zero (no PST number)
            bytes 3-4 - Trace sequence number
word 1     - IOSB address
word 2     - START I/O - DECB address
word 3     - START I/O - RBN/M
word 4     - Buffer address
word 5     - Buffer data (offset X'40' into buffer)
word 6     - byte 1 - Request type
            - byte 2 - not used
            - byte 3 - 'M' DCBFDAD seek value (MBBCCCHR)
            - byte 4 - 'C' DCBFDAD seek value (MBBCCCHR)
word 7     - CHHR DCBFDAD seek value (MBBCCCHR)

```

### X'61' trace entry

The X'61' trace entry is shown.

#### The X'61' trace entry

```

TRACE ID   = X'61'

word 0     - byte 1 - X'61' OSAM POST
            byte 2 - Zero (no PST number)
            bytes 3-4 - Trace sequence number
word 1     - IOSB address
word 2     - DCB address
word 3     - byte 1 - DFSA0S70 INTERNAL TRACE BYTE
            byte 2 - TOTAL I/O COUNT FOR THIS STARTIO
            bytes 3-4 - Sequence number of associated X'60' entry
word 4     - Buffer address
word 5     - Buffer data (offset X'40' into buffer)
word 6     - byte 1 - POST code
            byte 2 - not used
            byte 3 - 'M' DCBFDAD seek value (MBBCCCHR)
            byte 4 - 'C' DCBFDAD seek value (MBBCCCHR)

```

word 7 - CHHR DCBFDAD seek value (MBBCCCHHR)

### X'62' trace entry

The X'62' trace entry is shown.

### The X'62' trace entry

```
TRACE ID = X'62'

word 0 - byte 1 - X'62' OSAM trace entry for OPEN/CLOSE/EOV
        - byte 2 - Zero (no PST number)
        - bytes 3-4 - Trace sequence number
word 1 - Not used
word 2 - DCB address
word 3 - DCBRELA
word 4 - byte 1 - Not used
        byte 2 - R15 return code
        bytes 3-4 - Not used
word 5 - OPEN/CLOSE/EOV error code (same as in message DFS07301)
word 6 - byte 1 - Caller's function
        - byte 2 - Not used
        - byte 3 - 'M' value from DCBFDAD
word 7 - byte 1 - 'CHHR' from DCBFDAD
```

### X'69' trace entry

The X'69' trace entry is shown.

### The X'69' trace entry

```
TRACE ID = X'69'

word 0 - byte 1 - X'69' - Sequential Buffering buffer invalidation
        trace entry
        byte 2 - PST number
        bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - DMB number
        - byte 3 - DCB number
        - byte 4 - Function code at entry to DFSSBCI0 (see note 1 below)
word 2 - bytes 1-2 - Number of processed DCBs
        - bytes 3-4 - Number of invalidated SBH buffers
word 3 - DSG address of owner of the last invalidated SBH buffer
        or zero
word 4 - byte 1 - SBPSTTGS - Global serialization trace (see
        note 2 below)
        byte 2-4 - Not used
word 5 - Not used
word 6 - SBH buffer CB address of last invalidated SBH buffer or zero
word 7 - Block number in call or zero
```

### Notes:

#### 1. X'00'

Sequential Buffering buffer invalidation trace entry.

#### X'01'

Sequential Buffering buffer invalidation trace entry.

#### X'02'

Invalidate specific according to OSAM buffer prefix.

#### 2. X'80'

Global serialization entered (SBH search started).

#### X'40'

Waiting for PST to be posted.

## X'6A' trace entry

The X'6A' trace entry is shown.

### The X'6A' trace entry

#### TRACE ID = X'6A'

```
word 0 - byte 1 - X'6A' - Sequential Buffering buffer
          evaluation trace entry
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - DMB number
          - byte 3 - DCB number
          - byte 4 - Not used
word 2 - byte 1 - Type of evaluation (see note 1)
          - byte 2 - Not used
          - byte 3 - Result of evaluation of sequentially
                    (see note 2)
          - byte 4 - Result of evaluation of I/O rate (see note 2)
word 3 - DSG address
word 4 - SBPSTCNB (=SBH CALL NUMBER THIS PST)
word 5 - byte 1 - Not used
          - bytes 2-4 - Threshold cost for SB logic
word 6 -   byte 1 - Not used
          - bytes 2-4 - Current cost of SB logic
word 7 - bytes 1-2 - Threshold value for I/O rate
          - bytes 3-4 - Current value of I/O rate
```

#### Notes:

##### 1. C'P'

Periodical evaluation

##### C'E'

Early evaluation

##### 2. C'P'

Evaluation is positive

##### C'N'

Evaluation is negative

## X'6B' trace entry

The X'6B' trace entry is shown.

### The X'6B' trace entry

#### TRACE ID = X'6B'

```
word 0 - byte 1 - X'6B' - Indicates why SB was or was not used
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
word 1 - C'TERM'
word 2 - byte 1 - SCDSBFL - Sequential buffering flag (see note 1)
          - byte 2 - Resource allocation failure (see note 2)
          - byte 3 - Info from user exit routine (see note 3)
          - byte 4 - SBPSTITR - Termination trace flag (see note 4)
word 3 - Not used
words 4-5 - Job name
words 6-7 - PSB name
```

#### Notes:

##### 1. X'80'

...SCDSBNSB: DON'T LOAD SB MODULES

##### X'20'

...SCDSBLER: ERROR WHILE LOADING SB MODULES SB

##### X'10'

...SCDSBOER: OTHER SB ERRORS

- 2. **X'80'**  
...SBPSTGM1: GM ERROR FOR CB OR WORKAREA
- X'40'**  
...SBPSTGM2: GM ERROR FOR SBH BUFFERS
- X'20'**  
...SBPSTGM3: MAXSB= LIMIT EXHAUSTED
- X'10'**  
...SBPSTGM4: MAX NBR OF IOSB EXHAUSTED
- X'08'**  
...SBPSTGM5: GETIOSB FAILURE
- X'04'**  
...SBPSTGM6: PAGE-FIX ERROR
- X'02'**  
...SBPSTGM7: I/O-ITASK INIT FAILURE
- X'01'**  
...SBPSTGM8: GM ERROR FOR CB OR WORKAREA
- 3. **X'80'**  
...SBPRMPDI: DISALLOW USAGE OF SB
- X'40'**  
...SBPRMPAD: CONDITIONAL ACTIV BY DEFAULT
- 4. **X'80'**  
...SBPSTITP: USER PROVIDED SB= KEYW IN PSBGEN
- X'40'**  
...SBPSTITC: SBPARM CARD PROCESSED
- X'01'**  
...SBPSTITS: /STOP SB ISSUED BY MTO

### **X'6C' trace entry**

The X'6C' trace entry is shown.

### **The X'6C' trace entry**

**TRACE ID = X'6C'**

```

word 0 - byte 1 - X'6C' - Indicates if Sequential buffering was
                    used trace entry
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - DMB number
          - byte 3 - DCB number
          - byte 4 - Not used
word 2 - bytes 1-2 - Number of refreshed SBH buffers
          - bytes 3-4 - Number of invalidated SBH buffers
word 3 - DSG address of owner of the last touched SBH
          buffer or zero
word 4 - byte 1 - SBPSTTGS - Global serialization
          trace (see note below)
          - bytes 2-4 - Not used
word 5 - OSAM BH prefix address
word 6 - SBH buffer CB address of last touched buffer or zero
word 7 - Block number

```

### **Notes:**

#### **X'80'**

Global serialization entered (SBH search started).

#### **X'40'**

Waiting PST was posted.

## X'6F' trace entry

The X'6F' trace entry is shown.

### The X'6F' trace entry

```
TRACE ID = X'6F'

word 0 - byte 1 - X'6F' - Sequential Buffering search by RBA issued
          by OSAM BH trace entry
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - DMB number
          - byte 3 - DCB number
          - byte 4 - Last byte of return code from OSAM BH
word 2 - First trace word within SDSG
word 3 - DSG address
word 4 - Second trace word within SDSG
word 5 - OSAM BH prefix address
word 6 - SBH buffer CB address
word 7 - Block number
```

## X'80', X'81', X'82' trace entries

The 'X'80', X'81', and X'82' trace entries are shown.

### The X'80', X'81', X'82' trace entry

```
TRACE ID = X'80', X'81', X'82'

word 0 - byte 1 - X'80', X'81', X'82' - Database authorization,
          change-authorization, and re-authorization request
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
words 1-2 - AURDBDNM - database name
word 3 - byte 1 - AURACC - database access
          - byte 2 - AURECD - authorized encoded state
          - byte 3 - AURSLV - database share level
          - byte 4 - AURWRKC - authorization work field
word 4 - bytes 1-2 - AURDMBNO - Global DMB number
          - bytes 3-4 - AURERRCD - DBRC error reason code
word 5 - AURSYSID - IMS online subsystem id
word 6 - AURDDIRA - DDIR address
word 7 - AURDSGCH - DSG address of last in DSG chain
          or
word 7 - TCB number for restart authorization by DFSRDA00
```

## X'AA' trace entry

The X'AA' trace entry is shown.

### The X'AA' trace entry

```
TRACE ID = X'AA'

word 0 - byte 1 - X'AA' - Analyzer entry - This entry is created
          for each call passed to DFSDLA00. All entries
          are the internal activities in IMS that take place
          as a result of the user call. Be sure to use only the
          entries with the same PST number as the one identified
          as the failing PST.
          byte 2 - PST number (see note 1 below)
          bytes 3-4 - Trace sequence number
word 1 - Address of user parameter list (this list consists of all
          entries up to and including the entry with a X'80' in the
          high-order byte of a word.
word 2 - Call function for current call (GU, GN and so on -
          see note 2 below)
word 3 - PCB address for current call
words 4-5 - If DB PBC, LEVLEV thru LEVSEGOFF (first 10 bytes of level
          table for level of segment returned on prior call) IF
          TP PCB, character string is TP CALL
word 6 - bytes 1-2 - If DB PBC, LEVLEV thru LEVSEGOFF (first 10 bytes
          of level table for level of segment returned on prior
```

call) IF TP PCB, character string is TP CALL  
 bytes 3-4 - Status code in PCB from prior call (see  
 note 3 below)  
 word 7 - LEVSDB - SDB address for level of segment returned on prior call

**Notes:**

1. Use only the trace entries for the PST that had the failure.
2. Determine the current call.
3. Shows how the prior call for this PCB completed.

**X'AB' trace entry**

The X'AB' trace entry is shown, with data set information, caller information, VSAM request option 1, and VSAM request option 2 listed.

**The X'AB' trace entry**

**TRACE ID = X'AB'**

word 0 - byte 1 - X'AB' - ABEND U0427 trace entry  
 byte 2 - PST number  
 bytes 3-4 - X'0427'  
 word 1 - byte 1 - PSTFNCTN - Buffer handler function code  
 - byte 2 - RPLREQ  
 - bytes 3-4 - Trace sequence number  
 word 2 - bytes 1-2 - Offset to abend within DFSDVSM0  
 - byte 3 - DSGINDA - data set information (see note 1)  
 - byte 4 - DSGINDB - caller information (see note 2)  
 word 3 - RPLI address (Register 8)  
 word 4 - RPLARG - VSAM argument  
 word 5 - RPLAREA - VSAM area pointer  
 word 6 - byte 1 - RPLERREG - VSAM return code  
 - byte 2 - RPLERRCD - VSAM error code  
 - byte 3 - RPLOPT1 - VSAM request option (see note 3)  
 - byte 4 - RPLOPT2 - VSAM request option (see note 4)  
 word 7 - AMP address

**Notes:**

1. See the following table for data set information.

*Table 20. Data set information*

| Code (hex) | DSGINDA  | Definition                       |
|------------|----------|----------------------------------|
| X'80'      | DSGDSOLS | This is the last DSG in JCB.     |
| X'44'      | DSGDSORI | Data set group is root in index. |
| X'20'      | DSGDSOHD | Data set group is HDAM.          |
| X'10'      | DSGDSOHI | Data set group is HDAM.          |
| X'08'      | DSGDSOH2 | Data set group is HISAM case 2.  |
| X'04'      | DSGDSOH1 | Data set group is HISAM.         |
| X'02'      | DSGDSOHS | Data set group is HSAM or SSAM.  |
| X'01'      | DSGVSAM  | Data set group is VSAM.          |

2. See the following table for caller information.

*Table 21. Caller information*

| Code (hex) | DSGINDB  | Description                          |
|------------|----------|--------------------------------------|
| X'80'      | DSGSETLR | From SETL routine for SYNAD routine. |

Table 21. Caller information (continued)

| Code (hex) | DSGINDB  | Description                                           |
|------------|----------|-------------------------------------------------------|
| X'40'      | DSGGETR  | From GET routine for SYNAD routine.                   |
| X'20'      | DSGBATIS | Record returned is batch, DSGIRECA is actual address. |
| X'10'      | DSGNXTIS | Next sequential root is current keyed record.         |
| X'08'      | DSGSETL2 | Second SETL has been issued.                          |
|            | DSGSETK2 | Move key to DSG high key area.                        |
| X'04'      | DSGGETGT | A GET in BISAM being done using a SETL GT.            |
| X'02'      | DSGKEYSR | Buffer pool has been searched for key.                |
| X'01'      | DSGSTLIS | This is STL for INSERT.                               |

3. See the following table for VSAM request option 1.

Table 22. VSAM request option

| Code (hex) | RPLOPT1  | Description          |
|------------|----------|----------------------|
| X'80'      | RPLLOC   | Locate mode.         |
| X'40'      | RPLDIR   | Direct processing.   |
| X'20'      | XRPLSEQ  | Sequential.          |
| X'10'      | RPLSKP   | Skip SEQ access.     |
| X'08'      | RPLASY   | Asynchronous.        |
| X'04'      | RPLKGE   | Search key GT/EQ.    |
| X'02'      | RPLGEN   | Generic key request. |
| X'01'      | RPLECBSW | External ECB.        |

4. See the following table for VSAM request option 2.

Table 23. VSAM request option 2

| Code (hex) | RPLOPT2  | Description               |
|------------|----------|---------------------------|
| X'80'      | RPLKEY   | Keyed access.             |
| X'40'      | RPLADR   | Addressed access.         |
|            | RPLADD   | Addressed access.         |
| X'20'      | RPLCNV   | CINV access (by RBA).     |
| X'10'      | RPLBWD   | FWD=0/BWD=1               |
| X'08'      | RPLLRD   | ARD=0/LRD=1               |
| X'04'      | RPLWAITX | SYN processing wait exit. |
| X'02'      | RPLUPD   | Update.                   |
| X'01'      | RPLNSP   | Note string position.     |



## X'AC' trace entry

The X'AC' trace entry is shown.

### The X'AC' trace entry

#### TRACE ID = X'AC'

word 0 – byte 1 - X'AC' - Database call analyzer entry (only present in a DBCTL environment)  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 – Eye -catcher RTKN  
word 2 – Not used  
word 3 – Not used  
words 4-7 – This 16-byte CCTL recovery token is used to correlate DL/I activity on other subsystems

## X'C4' trace entry

The X'C4' trace entry is shown.

### The X'C4' trace entry

#### TRACE ID = X'C4'

word 0 – byte 1 - X'C4' - DELETE/REPLACE used to provide diagnosis information for error conditions. This entry is written when an error is detected.  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 – byte 1 - ID invoking subroutine (see note 2 below; see note 3 below)  
          byte 2 - ID of originating subroutine (see note 3 below)  
          byte 3 - Subcode (set by originating subroutine - see note 3 below)  
          byte 4 - Internal code for status code or pseudoabend (see note 3 below)  
word 2 – SDB for replace operation. DLTWS for delete operation.  
          Register value 7.  
word 3 – Level table for replace operation. DLTWA address for delete operation.  
          Register value 8.  
word 4 – Usually the PSDB address for segment. Register value 6.  
word 5 – byte 2 - DELETE/REPLACE return code  
          byte 2 - Return offset from caller's CSECT  
word 6 – PSTDSGA - DSG address  
word 7 – Information local to the subroutine that might be useful in problem resolution

### Notes:

1. Use only the entries for the PST that abended.
2. When a DELETE/REPLACE failure occurs, you need the X'C4' entries to solve the problem. You can usually find several X'C4' entries in a row in the trace table. Scan up the trace table to the first (lowest trace sequence number) entry. This entry is usually the key to why the failure occurred. Level 2 needs this information to resolve the problem.
3. These 4 bytes, in word 2, in a DELETE/RELEASE error are documented in the *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes* for the various abends. This is ENTRY1 field referred to in the DELETE/REPLACE module.

### Related concepts

[“Using the DL/I trace facility” on page 162](#)

The DL/I trace facility is an important diagnostic tool that can help you determine the cause of a problem. Frequently, a problem occurs as a result of the interaction between two separate tasks. Interpreting the DL/I trace entries can be the best way of determining what each task was doing, and when.

### X'C6' trace entry

The X'C6' trace entry is shown.

#### The X'C6' trace entry

```
TRACE ID = X'C6'

word 0 - byte 1 - X'C6' - Special promote lock trace entry
         byte 2 - PST number (see note 1 below)
         bytes 3-4 - Trace sequence number
word 1 - byte 1-2 - Not used
         - byte 3 - Special lock/unlock call (see note 1)
         - byte 4 - Level of this lock
words 2-3 - C'PROMOTE '
word 4 - REQ address
word 5 - QCB address
words 6-7 - Resource id (see note 2)
```

#### Notes:

1. See the following table for special lock or unlock calls.

Table 24. Special lock or unlock calls

| Code (hex) | Special lock or unlock call | Description |
|------------|-----------------------------|-------------|
| X'08'      | PROENQ                      | Lock call   |
| X'10'      | PRODEQ                      | Unlock call |

2. Resource id is an 8-byte field:

```
bytes 1-4 - Complement of original RBA
bytes 5-6 - DMB number
byte 7 - DCB number
byte 8 - C'Z' id suffix
```

### X'C7' trace entry not using IRLM

The X'C7' trace entry is shown when not using the IRLM.

#### The X'C7' trace entry (when not using the IRLM)

```
TRACE ID = X'C7'

word 0 - byte 1 - X'C7' - Exclusive control deadlock detection trace
         entry (Written only when a conflict causes an abend.).
         byte 2 - PST number (see note 1 below)
         bytes 3-4 - Trace sequence number
word 1 - byte 1 - PST number (see note 1 below)
         bytes 2-4 - Address of PST to be backed out (gets
         ABENDU0777 - see note 3 below)
words 2-3 (see note 2 below) - byte 1 - PST number
         bytes 2-4 - Conflicting PST address
words 4-5 (see note 4 below) - PSB name
words 6-7 (see note 4 below) - DMB name
```

#### Notes:

1. The entry for the PST number that received abend U0777.
2. The addresses of the two conflicting PSTs.
3. The address of the PST that got received abend U0777.

4. The PSB and DMB name of the cause for the contention.

### **X'C7' trace entry using IRLM**

The X'C7' trace entry is shown when using the IRLM.

#### **The X'C7' trace entry (when using the IRLM)**

```
TRACE ID = X'C7'  
  
word 0 - byte 1 - X'C7'  
         byte 2 - 00  
         bytes 3-4 - Trace sequence number  
word 1 - Not used  
words 2-5 (see note 1 below) - byte 1 - PST number  
                               bytes 2-4 - PST address  
words 6-7 (see note 2 below) - Resource ID
```

#### **Notes:**

1. PST number and address of PSTs in deadlock net. If number of PSTs in deadlock net is greater than 4, only 4 are shown.
2. Resource ID that is the cause of the deadlock.

### **X'C8' trace entry**

The following figure shows the X'C8' trace entry.

#### **The X'C8' trace entry**

```
TRACE ID = X'C8'  
  
word 0 - byte 1 - X'C8' - Lock request manager entry (DFSLMGR0)  
         byte 2 - PST number  
         bytes 3-4 - Trace sequence number  
word 1 - byte 1 - Function - See macro DFSLMD for mapping of  
         each byte in this word  
         byte 2 - State (see note below)  
         byte 3 - Class - the class is the relative PST number  
         byte 4 - Flags  
word 2 - byte 1 - Return code from IRLM  
         bytes 2-4 - Can be PST, CLB, or SRB address  
word 3 - Can be resource name address, token, or altered  
         buffer mask  
word 4 - bytes 1-2 - Lock manager subcode (2 bytes). These bytes  
         along with the return code from IRLM define the  
         problem.  
         bytes 3-4 - This is a feedback area from the RLPL and is used  
         primarily by the IBM Support Center, if needed.  
words 5-7 - This is a feedback area from the RLPL and is used primarily  
         by the IBM Support Center, if needed.
```

**Notes:** The possible state settings and their meaning:

#### **X'00'**

Unconditional release

#### **X'02'**

Read

#### **X'04'**

Share

#### **X'06'**

Update

#### **X'08'**

Exclusive

## X'C9' trace entry

The X'C9' trace entry is shown.

### The X'C9' trace entry

#### TRACE ID = X'C9'

word 0 - byte 1 - X'C9' - Lock request manager entry (DFSLMGR0) exit  
byte 2 - PST number  
bytes 3-4 - Trace sequence number  
word 1 - byte 1 - Function - See macro DFSLMD for mapping of each byte in this word.  
byte 2 - State (see note below )  
byte 3 - Class - the class is the relative PST number  
byte 4 - Flags  
word 2 - byte 1 - Return code from IRLM  
bytes 2-4 - Can be PST, CLB, or SRB address  
word 3 - Can be resource name address, token, or altered buffer mask  
word 4 - bytes 1-2 - Lock manager subcode (2 bytes). These bytes along with the return code from IRLM define the problem.  
bytes 3-4 - This is a feedback area from the RLPL and is used primarily by the IBM Support Center, if needed.  
words 5-7 - This is a feedback area from the RLPL and is used primarily by the IBM Support Center, if needed.

**Notes:** The possible state settings and their meanings:

#### X'00'

Unconditional release

#### X'02'

Read

#### X'04'

Share

#### X'06'

Update

#### X'08'

Exclusive

## X'CA' trace entry

The X'CA' trace entry is shown.

### The X'CA' trace entry

#### TRACE ID = X'CA'

word 0 - byte 1 - X'CA' - Exclusive control ENQ/DEQ (PI - Program Isolation) trace entry  
byte 2 - PST number (see note 1 below)  
bytes 3-4 - Trace sequence number  
word 1 - byte 1 - Record type (see note 8 below)  
byte 2 - Class for Q command operation  
byte 3 - Requested function (Use PRM DSECT (PRMFUNCTN) - see note 2 below)  
byte 4 - PRMLEVEL - Level of control requested  
(1 =Read only, 2=Share, 3=Update, 4=Exclusive - see note 3 below)  
word 2 - bytes 1-2 - Wait count (how many times this task had to wait - see note 7 below)  
bytes 2-4 - Waited for count (number of tasks waiting for this resource)  
word 3 - PITIME relative to 00:00:00 on PIDATE (SCDPITIME)  
word 4 - bytes 1-2 - Feedback from DFSFXC10 (Use PRM DSECT, PRMFBK field. See note 5 below)  
byte 3 - Return code from DFSFXC10 (see note 6 below)  
byte 4 - PSFUNCT (function codes DSECT)  
word 5 - Token from DFSFXC10 (pointer to control block enqueued resource)  
word 6 - RBA or RBN (see note 4 below)

```
word 7 - bytes 1-2 - DMB number
         byte 3 - DCB number
         byte 4 - Not used
```

### Notes:

1. Use the entries for the PST in question. If you are checking a PI problem, you might have to find this entry and then scan up the trace table using the field in note 4 (below) as a search field to find the other PST that is using the resources.
2. The requested PI function.
3. The level at which the resource was requested.
4. The RBA or RBN of the resource requested by PI (relates to X'04' in the X'CC' trace entry).
5. The 2 bytes of feedback from DFSFXC10 (X'0C' and X'0D' in PRM DSECT).
6. The return code. DFSFXC10 RETURN CODES: 0 - Successful 4 - Wait required - usually has CB trace related to it 8 - Pseudoabend, either lost deadlock (U0777) or out of ENQ/DEQ space (U0775) C - Invalid call
7. If a resource (RBA or RBN) is currently owned and the task (PST) must wait, the "wait count" (2 bytes) is incremented in a X'CA' trace entry for the task (PST) that owns the resource. The "waited for count" (2 bytes) is incremented to show that another task is waiting for the resource. This wait should also cause a X'CA', X'CB' pair of trace entries to show the wait occurred. (See the X'CB' trace entry for more details on PI waits.)
8. This shows the type of X'CA' record this is. (X'CA-08' trace entry follows.)

#### **X'00'**

Standard trace PI record

#### **X'01'**

Timing ACT/ENQ wait - may have CB trace entry associated with it

#### **X'04'**

Lock MGR trace record

#### **X'08'**

DL/I call record - see X'CA' - X'08' trace entry

### **X'CA' trace entry, subtype X'08'**

The X'CA' trace entry, subtype X'08' is shown.

#### **TRACE ID = X'CA' - X'08'**

```
word 0 - byte 1 - X'CA'-X'08' - PI-DL/I call trace entry
         byte 2 - PST number
         bytes 3-4 - Trace sequence number
word 1 - byte 1 - X'08' = DL/I call record
         bytes 2-4 - Not used
word 2 - bytes 1-2 - Wait count (how many times this task
         had to wait)
         bytes 2-4 - Waited for count (number of tasks waiting
         for this resource)
word 2 (alternate) - bytes 1-4 - name of module writing the trace record
word 3 - PI time
word 4 - PST account field for function (count of
         the time of calls)
word 5 - DL/I call (GNP, ISRT, and so on)
words 6-7 - Not used
```

The content of word 2 depends on the module that wrote the trace record. Word 2 either contains DLA0 or the wait counts for the task.

### X'CA' trace entry

The X'CA' trace entry for Fast Path calls is shown.

#### The X'CA' trace entry for Fast Path calls

```
TRACE ID = X'CA'

word 0 - byte 1 - X'CA' - Exclusive control ENQ/DEQ (PI -
          Program Isolation) trace entry
          byte 2 - PST number (1)
          bytes 3-4 - Trace sequence number
word 1 - IRC1, indicating a Fast Path call
word 2 - Call Function (GU, GN, and so on)
word 3 - PROCOPT
word 4 - PI time (also in reg 5 in Fast Path trace,
          if active)
word 5 - A(PBC)
word 6 - A(EPCB)
word 7 - Not used
```

### X'CB' trace entry

The X'CB' trace entry is shown.

#### The X'CB' trace entry

```
TRACE ID = X'CB'

word 0 - byte 1 - X'CB' - PI - (Program Isolation) trace lock
          elapsed time
          byte 2 - PST number
          bytes 3-4 - Trace sequence number
words 1-2 - DMB Name for which the wait was performed
word 3 - Same as PITIME IN X'CA' record
word 4 - byte 1 - First byte of feedback from enqueue
          request
          byte 2 - PST owning resource at the time of wait
          bytes 3-4 - Trace sequence number on X'CA' record
word 5 - Elapsed time for enqueue wait
word 6 bytes 1-4 - word 8 bytes 1-3 - 7 bytes of resource ID
word 7 - byte 4 - Post code
```

### X'CC' trace entry

The X'CC' trace entry is shown.

#### The X'CC' trace entry

```
TRACE ID = X'CC'

word 0 - byte 1 - X'CC' - Lock request handler
          (DFSLRH00) entry
          byte 2 - PST number (see note 1 below)
          bytes 3-4 - Trace sequence number
word 1 - Block number on RBA (see note 2 below)
word 2 - PSTTOKEN - The object of the request
word 3 - PSTLRPRM - These bytes are described in the
          PSTLRPRM chart below. The first byte equates to byte
          0, the second to byte 1, and so on (see note 3 below).
word 4 - bytes 1-2 - Subcode from lock manager (IRLM) or PRMFBK
          feedback for DFSFXC10.
          byte 3 - Register 15 return code
          byte 4 - Return code from lock manager or DFSFXC10
          (Use DFSFXC10 return codes from the X'CA'
          trace entry, note 6) (See note 5 below)
word 5 - byte 1 - PSTLRSUB-DFSLRH00 abend subcode (see note 7 below)
          bytes 2-4 - PSTABTRM - System abend code (see note 6 below)
word 6 - PSTDSGA - Address of the DSG used by this PST
word 7 - byte 1 - Return register
          bytes 2-4 - Address within module where DFSLRH00 was called
```

**Notes:**

1. The PST number for the task (PST).
2. The RBA or RBN of the resource for which a request was issued in a X'CA' trace entry. When some of the problem types occur, you can find the same field or the beginning RBA of the block in the traces for a different PST number.
3. Shows what the request was.
4. For PI, these 2 bytes are in the PRM DSECT at X'0C' and X'0D'.
5. For PI, follow the above. The DFSFXC10 return code is usually also placed in the register 15 return code field.
6. A key field when DFSLRH00 issues an abend (such as U0855, U03301, U03302). The abend is in hexadecimal, not in decimal (for example, 855= X'0357', 3302= X'0CE6'). Ignore the field if an abend was not issued from DFSLRH00.
7. For abends issued by DFSLRH00, this field contains the Lock Request Handler abend subcode.

You might need the X'CC' trace entry for several problem types including:

- Task was allowed to process even though a wait was requested.
- DFSLRH00 abends (such as U0855, U03302).
- Request not satisfied. These problems might indicate an internal IMS error.

The following table shows the PSTLRPRM chart (bytes 0 through 3).

*Table 25. PSTLRPRM chart (bytes 0 through 3)*

| <b>Byte 0<br/>(hex)</b> | <b>Meaning</b>                                     |
|-------------------------|----------------------------------------------------|
| 11                      | Get local segment lock                             |
| 12                      | Get local data set busy lock                       |
| 13                      | Get local buffer update lock                       |
| 14                      | Get local Q command lock                           |
| 15                      | Get local catalog lock                             |
| 22                      | Get global buffer update lock                      |
| 23                      | Get global data set busy lock                      |
| 24                      | Get global data set extend lock                    |
| 25                      | Get global data set reference lock                 |
| 26                      | Get global command lock                            |
| 27                      | Get global command lock (CLB)                      |
| 30                      | Get local and global root locks                    |
| 31                      | Get local segment and global buffer update locks   |
| 32                      | Get local-global data set busy locks               |
| 33                      | Get local-global buffer update locks               |
| 34                      | Get local Q command and global buffer update locks |
| 37                      | Get global catalog lock                            |
| 41                      | Release local segment lock                         |
| 42                      | Release local data set busy lock                   |

Table 25. PSTLRPRM chart (bytes 0 through 3) (continued)

| Byte 0<br>(hex) | Meaning                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------|
| 43              | Release local buffer update lock                                                                   |
| 44              | Release local Q command lock                                                                       |
| 45              | Release local catalog lock                                                                         |
| 52              | Release global buffer update lock                                                                  |
| 53              | Release global data set busy lock                                                                  |
| 54              | Release global data set extend lock                                                                |
| 55              | Release global data set reference lock                                                             |
| 56              | Release global command lock                                                                        |
| 57              | Release global command lock (CLB)                                                                  |
| 60              | Release local and global root locks                                                                |
| 61              | Release local and global data set busy locks                                                       |
| 62              | Release local and global buffer update locks                                                       |
| 63              | Release local segment and global buffer update locks                                               |
| 67              | Release global catalog lock                                                                        |
| 70              | Test local lock share or update state                                                              |
| 71              | Test global lock share or update state                                                             |
| 72              | Test local and global lock share or update                                                         |
| 73              | Test feedback for local lock                                                                       |
| 74              | Test feedback for global lock                                                                      |
| 75              | Test feedback for local and global locks                                                           |
| 80              | LRHGIRDY new root, LRHRRIDY old root                                                               |
| 81              | Release alternate local and global root locks                                                      |
| 82              | Get local segment and local and global buffer update locks                                         |
| 83              | Release all subsystem global busy locks                                                            |
| 84              | Release all subsystem locks                                                                        |
| 86              | Transfer locks                                                                                     |
| 87              | Change locks into retained status                                                                  |
| 90              | Get Fast Path lock                                                                                 |
| 91              | Release Fast Path lock                                                                             |
| 92              | Change ownership of Fast Path lock                                                                 |
| 93              | Force known locks for Fast Path                                                                    |
| 94              | Change locks to retain locks for Fast Path                                                         |
| 95              | Change ownership of Fast Path UOW lock from release lock ITASK to PST dependent region (HSSP only) |



Table 25. PSTLRPRM chart (bytes 0 through 3) (continued)

| <b>Byte 0<br/>(hex)</b> | <b>Meaning</b>                                          |
|-------------------------|---------------------------------------------------------|
| 96                      | Change locks to retain locks for DL/I                   |
| 97                      | Invalid call if function is equal to or greater than 97 |
| <b>Byte 1<br/>(hex)</b> | <b>Meaning</b>                                          |
| 80                      | MODE=COND                                               |
| 40                      | MODE=UNCOND                                             |
| 10                      | Owning WU given on RRIDX                                |
| 00                      | Mode not applicable                                     |
| <b>Byte 2<br/>(Hex)</b> | <b>Meaning</b>                                          |
| 01                      | STATE=READ                                              |
| 02                      | STATE=SHARE                                             |
| 03                      | STATE=UPDATE                                            |
| 04                      | STATE=EXCL                                              |
| F0                      | STATE PRESET (Fast Path)                                |
| 00                      | STATE not applicable                                    |
| <b>Byte 3<br/>(hex)</b> | <b>Meaning</b>                                          |
| 80                      | CLB call if LRHPRMFL=X'80'                              |
| C0                      | Fast Path request                                       |
| 68                      | Root lock request                                       |
| 40                      | 'Single' request                                        |
| 20                      | 'Local' request                                         |
| 10                      | 'Get' request                                           |
| 08                      | 'P-Lock' request                                        |
| 07                      | 'Combined' request if <= X'07'                          |
| 01                      | LRHTTLKX, LRHTIBDX                                      |
| 02                      | LRHGRIDU, LRHRRIDW                                      |
| 03                      | LRHGSEGX, LRHRSEGX                                      |
| 04                      | LRHGBIDX, -RBIDX, -GBIDA                                |
| 05                      | LRHGZIDX, LRHRZIDX                                      |
| 06                      | LRHGQCMX                                                |
| 00                      | LRHRZIDA, LRHRALLX                                      |

## X'CF' trace entry

The X'CF' trace entry is shown.

### The X'CF' trace entry

```
TRACE ID = X'CF'

word 0 - byte 1 - x'CF' - I/O toleration (DFSTOPR0)
                                trace entry
        byte 2 - PST number
        bytes 3-4 - Trace sequence number
word 1 - byte 1 - I/O toleration return code
        - byte 2 - TORFUNC - I/O toleration function
          code (see note 1)
        - byte 3 - TORFLG1 - I/O toleration flag 1 (see
          note 2)
        - byte 4 - TORFLG2 - I/O toleration flag 2 (see
          note 3)
words 2-3 - EEQEFLCS - EEQE flags
word 4 - DDIR or DMAC address
word 5 - RBA or RBN
word 6 - bytes 1-2 - DMB number
        - byte 3 - DCB number
        - byte 4 - TORWORK+2 when DBRC change of EEQE
word 7 - EEQE address
```

#### Notes:

1. See the following table for I/O toleration function codes.

Table 26. I/O toleration function codes

| Code (hex) | TORFUNC  | Description                             |
|------------|----------|-----------------------------------------|
| X'01'      | TORCEQE  | Create EEQE.                            |
| X'02'      | TORDEQE  | Delete EEQE.                            |
| X'04'      | TORFEQE  | Find I/O toleration EEQE.               |
| X'08'      | TORMEQE  | Copy/Move to I/O toleration buffer.     |
| X'10'      | TORNEQE  | Send notifies on I/O toleration EEQE's. |
| X'20'      | TORPURG  | Close I/O toleration mode.              |
| X'40'      | TORDUI   | Process DBRC DUI call EEQE list.        |
| X'80'      | TORDBCL  | DB close I/O error write retry.         |
| X'C0'      | TORCHKPT | Do system checkpoint logging.           |

2. See the following table for I/O toleration flag 1.

Table 27. I/O toleration flag 1

| Code (hex) | TORFLG1  | Description                                                                                                                  |
|------------|----------|------------------------------------------------------------------------------------------------------------------------------|
| X'80'      | TOR1FP   | <ul style="list-style-type: none"><li>• If on, Fast Path.</li><li>• If off, DL/I.</li></ul>                                  |
| X'40'      | TOR1NOT  | Creator is notify.                                                                                                           |
| X'20'      | TOR1PST  | <ul style="list-style-type: none"><li>• If on, then R0 has PST address.</li><li>• If off, then R0 has SCD address.</li></ul> |
| X'10'      | TOR1RST  | Caller is restart log read.                                                                                                  |
| X'01'      | TOR1FPIR | DBFMIOS0: FP IDT resolution.                                                                                                 |

Table 27. I/O toleration flag 1 (continued)

| Code (hex) | TORFLG1  | Description                    |
|------------|----------|--------------------------------|
| X'90'      | TOR1FPRS | Caller is FP restart log read. |

3. See the following table for I/O toleration flag 2.

Table 28. I/O toleration flag 2

| Code (hex) | TORFLG2  | Description                    |
|------------|----------|--------------------------------|
| X'80'      | TOR2IOT  | Creator is I/O toleration.     |
| X'40'      | TOR2RD   | Creator is read error.         |
| X'20'      | TOR2WRT  | Creator is write error.        |
| X'10'      | TOR2USER | Creator is DBRC command.       |
| X'08'      | TOR2PERM | Creator is permanent.          |
| X'04'      | TOR2IDT  | Creator is indoubt process.    |
| X'01'      | TOR2NDX  | EEQEFLG2:EEQENDX KSDS INDEX CI |

### X'D0' trace entry

The X'D0' trace entry is shown.

### The X'D0' trace entry

Words 0 and 1 are common to all X'D0' trace entries. The format of words 2 through 7 depends on the content of the trace entry.

#### Word 0

##### Byte 1

X'D0' - IRLM notify sent trace entry

##### Byte 2

PST number

##### Bytes 3 and 4

Trace sequence number

#### Word 1

##### Byte 1

Sub-route code:

**4**

VSAM buffer invalidation

**8**

VSAM write I/O error

**12 or 40**

VSAM data set extension

**16**

OSAM buffer invalidation

**20**

OSAM write I/O error

**24 or 44**

OSAM data set extension

**28**

Force snap

**32 or 36**

Extended error queue element add or delete

**48**

Added RSR sharing partner

**Bytes 2 and 3**

DMB number or PID for partition

**Byte 4**

DCB number

Format for buffer invalidation or write error notify: Words 2 - 7 use the following format in a trace record for a buffer invalidation or write error notification:

**Word 2**

RBN/RBA of buffer

**Word 3**

Not used

**Word 4**

Not used

**Word 5**

Not used

**Word 6****Bytes 1 to 3**

Not used

**Byte 4**

NCBFLAG

**Word 7**

Not used

Format for OSAM data set extend: Words 2 - 7 use the following format in a trace record for an OSAM data set extension:

**Word 2**

DCBHIBLK

**Word 3**

DCBRLBLK

**Word 4**

DCBRBASN

**Word 5**

Volume serial number

**Word 6****Bytes 1 and 2**

Volume serial number (continued)

**Byte 3**

Not used

**Byte 4**

NCBFLAG

**Byte 7**

Not used

Words 2 - 7 use the following format in a trace record for a VSAM data set extension:

**Word 2**

VSILVL - VSI level number (current)

**Word 3**

VSIHRBA - Highest-used relative byte address (current)

**Word 4**

VSIERBA - Highest-allocated relative byte address (current)

**Word 5**

VSILVL - VSI level number (extent)

**Word 6**

VSIHRBA - Highest-used relative byte address (extent)

**Word 7**

VSIERBA - Highest-allocated relative byte address (extent)

**X'D1' trace entry**

The X'D1' trace entry contains information about buffer invalidations or write errors.

Words 0 and 1 are common to all X'D1' trace entries. The format of words 2 through 7 depends on the content of the trace entry.

**Word 0****Byte 1**

Trace entry code X'D1'

**Byte 2**

Not used (no PST number)

**Bytes 3 and 4**

Trace sequence number

**Word 1****Byte 1**

Sub-route code from the DFSNCB macro

**Bytes 2 and 3**

DMB number or PID for partition

**Byte 4**

DCB number

Words 2 - 7 for a buffer invalidation or write error notification record use the following format:

**Word 2**

RBN/RBA of buffer

**Word 3**

Buffer prefix address

**Word 4****Byte 1**

SB global serialization trace field:

**X'80'**

Global serialization entered (SBH search started)

**X'40'**

Waiting PST was posted.

**Byte 2**

Not used

**Bytes 3 and 4**

Number of invalidated buffers

**Word 5**

Last invalidated buffer address

**Word 6****Bytes 1, 2, and 3**

Not used

**Byte 4**

NCBFLAG

**Word 7**

Subsystem ID

Words 2 - 7 for an OSAM data set extent record use the following format:

**Word 2**

DCBHIBLK

**Word 3**

DCBRLBLK

**Word 4**

DCBRBASN

**Word 5**

Volume serial number

**Word 6****Bytes 1 and 2**

Volume serial number

**Byte 3**

Not used

**Byte 4**

NCBFLAG

**Word 7**

Subsystem ID

Words 2 - 7 for a VSAM data set extent record use the following format:

**Word 2**

VSILVL - VSI level number (current)

**Word 3**

VSIHRBA - Highest relative byte address (current)

**Word 4**

VSILVL - VSI level number (extent)

**Word 5**

VSIHRBA - Highest relative byte address (extent)

**Word 6**

AMP address

**Word 7**

Subsystem ID

**X'D5' trace entry**

The X'D5' trace entry contains information about coupling facility call requests.

X'D5' traces the completion or failure of each call request. If it finds an error, it logs error-related data and abnormally terminates with a dump. The module return and reason codes are also set in R0 and R15.

**TRACE ID = X'D5'**

```

word 0 - bytes 1-4 - X'D5' - The module name 'DMAW.'
word 1 - bytes 1-4 - Last service used:
                    "CACH" - IXLCACHE,
                    "CONN" - IXLCONN,
                    "DISC" - IXLDISC,
                    "FUNC" - invalid MAWP1 function,

```

```

"VRP " - IDAMDVRP
word 2 - bytes 1-4 - Type of request:
"DATA" - for IDAMDVRP,TYPE=DATA,
"INDE" - for IDAMDVRP,TYPE=INDEX,
"OSAM" - for IXLCONN,IXLDISC,
"RDRG" - for IXLCACHE,
"VSAM" - for IXLCONN,IXLDISC,
"XI " - for IXLCACHE
word 3 - Return code from service (PSTIXLRF).
word 4 - Reason code from service (PSTIXLR0).
word 5 - Processing flags for DFSDMAW0 (MAWBFLGS).

```

```

ENTRY1 - IXCYENFFUNCTION FUNCTION CODE
ENTRY2-3 - Value DFSDENF0
ENTRY4-7 - Value of the STRUCTURE NAME

```

### X'D9' trace entry

The X'D9' trace entry is shown.

### The X'D9' trace entry - words 0 through 2

Most X'D9' trace entries have the following information in the first three words, except for OLR command processing. The following figure shows words 0 through 2 of the X'D9' trace entry.

```

TRACE ID = X'D9'

word 0 - byte 1 - x'D9' - Online Reorganization (OLR) trace
        entry.
        byte 2 - PST number.
        bytes 3-4 - Trace sequence number.
word 1 - byte 1 - Module ID.
        byte 2 - Module subcode.
        bytes 3-4 - Local DMB number.
word 2 - bytes 1-2 - Global DMB number.
        bytes 3-4 - Partition ID.

```

### X'D9' trace entry: OLR output data set validation or creation and inactive data set deletion

The following figure shows words that are specific to the OLR output data set validation or creation and inactive data set deletion.

```

TRACE ID = X'D9'

word 3 - bytes 1-2 - Error message number as four packed
        decimal digits or as binary 0 if there
        is no error.
        byte 3 - Reserved, 0.
        byte 4 - DCB number for the data set involved.
        The x'80' bit is on if the data set is
        one of the M through V and Y data sets
        (see notes 1 and 2 below).
word 4 - bytes 1-4 - DDIR address.

```

### Notes:

1. When no error has occurred, the error message number in word 3 has a value of binary zero, and there is no further information in the trace entry beyond word 4.
2. For the following error message numbers, there is information that is specific to the particular error:

Unexpected error from system macro instruction:

```

words 5-6 - Macro name.
word 7 - bytes 1-2 - Return code.
        bytes 3-4 - Reason Code.

```

2991 - Output data set validation error:

word 5 - Reason code from DFS2991I message text.

#### 2992 - Unexpected error from CSI or catalog management, form 1:

word 5 - Reason area from CSI or catalog management  
word 6 - byte 1 - Reason area type:  
          'C' catalog error  
          'D' data set error  
          'I' CSI call

#### 2992 - Unexpected return code from CSI, form 2:

word 5 - Return code from CSI call.  
word 6 - byte 1 - X'00'  
          bytes 2-4 - Reason code from CSI call.

#### 2993 - Unexpected device class:

word 5 - byte 1 - UCB device class.

#### 2994 - Unexpected IDCAMS return code creating a data set:

word 5 - Return code from IDCAMS.

#### 2995 - Unexpected IDCAMS return code deleting a data set:

word 5 - Return code from IDCAMS.

#### 2996 - Insufficient DASD space to create a data set:

word 5 - bytes 1-2 - SVC 99 error reason  
                    code.  
          bytes 3-4 - Reserved.  
word 6 - SMS error reason code.  
word 7 - Number of blocks wanted.

#### 2998 - Miscellaneous SVC 99 errors creating a data set:

word 5 - SVC 99 error reason  
                    code.  
          bytes 3-4 - Reserved.  
word 6 - SMS error reason code.  
word 7 - Number of blocks wanted.

The following table shows the module ID and module subcode values for the X'D9' trace entries that represent the OLR output data set validation or creation process and the inactive data set deletion process.

*Table 29. Module and subcode ID for X'D9'*

| Module ID | Module   | Subcode | Meaning                           |
|-----------|----------|---------|-----------------------------------|
| A         | DFSORA00 | X'10'   | Data set creation successful      |
| A         | DFSORA00 | X'11'   | Data set creation successful      |
| A         | DFSORA00 | X'12'   | Data set creation successful      |
| A         | DFSORA00 | X'13'   | Data set creation successful      |
| A         | DFSORA00 | X'14'   | Data set validation successful    |
| A         | DFSORA00 | X'15'   | Data set validation successful    |
| A         | DFSORA00 | X'16'   | Data set validation successful    |
| A         | DFSORA00 | X'20'   | Primary index was not a VSAM KSDS |



Table 29. Module and subcode ID for X'D9' (continued)

| Module ID | Module   | Subcode | Meaning                                                     |
|-----------|----------|---------|-------------------------------------------------------------|
| A         | DFSORA00 | X'21'   | VSAM data set did not have REUSE attribute                  |
| A         | DFSORA00 | X'22'   | VSAM record length did not match input                      |
| A         | DFSORA00 | X'23'   | VSAM control interval size did not match input              |
| A         | DFSORA00 | X'24'   | KSDS key offset or length size did not match input          |
| A         | DFSORA00 | X'25'   | Miscellaneous errors; another trace entry precedes this one |
| A         | DFSORA00 | X'C1'   | Internal error: invalid DFSORA00 call                       |
| A         | DFSORA00 | X'C2'   | Internal error: No data set in X'2930' log record           |
| A         | DFSORA00 | X'C3'   | Invalid input data set                                      |
| A         | DFSORA00 | X'C4'   | Multi-volume input, but no output data set                  |
| A         | DFSORA00 | X'C5'   | Non-DASD data set                                           |
| A         | DFSORA00 | X'C6'   | Multi-volume data set to be recovered                       |
| A         | DFSORA00 | X'C7'   | Non-DASD data set                                           |
| A         | DFSORA00 | X'C8'   | Data set not usable for OSAM                                |
| A         | DFSORA00 | X'C9'   | Data set is a PDS or PDSE                                   |
| A         | DFSORA00 | X'D1'   | Data set is not VSAM                                        |
| A         | DFSORA00 | X'D2'   | Data set is not a VSAM KSDS                                 |
| A         | DFSORA00 | X'D3'   | VSAM data set did not have REUSE attribute                  |
| A         | DFSORA00 | X'D4'   | VSAM record length did not match input                      |
| A         | DFSORA00 | X'D5'   | VSAM control interval size did not match input              |
| A         | DFSORA00 | X'D6'   | KSDS key offset or length size did not match input          |
| A         | DFSORA00 | X'D7'   | Data set not usable for OSAM                                |
| A         | DFSORA00 | X'D8'   | Data set is a PDS or PDSE                                   |
| A         | DFSORA00 | X'D9'   | Data set is not VSAM                                        |
| A         | DFSORA00 | X'E2'   | Data set is not a VSAM KSDS                                 |
| A         | DFSORA00 | X'E3'   | VSAM data set did not have REUSE attribute                  |

Table 29. Module and subcode ID for X'D9' (continued)

| Module ID | Module   | Subcode | Meaning                                            |
|-----------|----------|---------|----------------------------------------------------|
| A         | DFSORA00 | X'E4'   | VSAM record length did not match input             |
| A         | DFSORA00 | X'E5'   | VSAM control interval size did not match input     |
| A         | DFSORA00 | X'E6'   | KSDS key offset or length size did not match input |
| A         | DFSORA00 | X'E7'   | Data set not usable for OSAM                       |
| A         | DFSORA00 | X'E8'   | Data set is a PDS or PDSE                          |
| A         | DFSORA00 | X'E9'   | Data set is not VSAM                               |
| B         | DFSORA10 | X'C1'   | Data set error reported by CSI                     |
| B         | DFSORA10 | X'C2'   | No error information available from CSI            |
| B         | DFSORA10 | X'C3'   | Catalog error reported by CSI                      |
| B         | DFSORA10 | X'C4'   | Unexpected return code 4 from CSI                  |
| B         | DFSORA10 | X'C5'   | Unexpected return code 4 from CSI                  |
| B         | DFSORA10 | X'C6'   | Unexpected return code from CSI                    |
| B         | DFSORA10 | X'C7'   | Unexpected return code from DEVTYPE                |
| B         | DFSORA10 | X'C8'   | Data set not on volume                             |
| B         | DFSORA10 | X'C9'   | Unexpected return code from OBTAIN                 |
| B         | DFSORA10 | X'D1'   | Unexpected return code from OBTAIN                 |
| B         | DFSORA10 | X'D2'   | Unexpected return code from TRKCALC                |
| B         | DFSORA10 | X'D3'   | Unexpected return code 12 from GETDSAB             |
| B         | DFSORA10 | X'D4'   | Unexpected return code from GETDSAB                |
| B         | DFSORA10 | X'D5'   | Unexpected return code from SWAREQ                 |
| B         | DFSORA10 | X'D6'   | Invalid data set name                              |
| D         | DFSORA20 | X'C1'   | SVC 99 information reason returned                 |
| D         | DFSORA20 | X'C2'   | Insufficient space on volume                       |
| D         | DFSORA20 | X'C3'   | Data set in use                                    |
| D         | DFSORA20 | X'C4'   | Insufficient space, SMS                            |
| D         | DFSORA20 | X'C5'   | SVC 99 error and SMS reason returned               |
| D         | DFSORA20 | X'C6'   | SVC 99 error code returned                         |

Table 29. Module and subcode ID for X'D9' (continued)

| Module ID | Module   | Subcode | Meaning                            |
|-----------|----------|---------|------------------------------------|
| D         | DFSORA20 | X'C7'   | SVC 99 error code returned         |
| D         | DFSORA20 | X'C8'   | Unexpected return code from SVC 99 |
| D         | DFSORA20 | X'C9'   | SVC 99 information reason returned |
| D         | DFSORA20 | X'D1'   | SVC 99 error code                  |
| D         | DFSORA20 | X'D2'   | Unexpected return code from SVC 99 |
| D         | DFSORA20 | X'D3'   | Unexpected return code from IDCAMS |
| E         | DFSORA30 | X'C1'   | Unexpected return code from IDCAMS |
| G         | DFSORA40 | X'C1'   | GETMAIN failure                    |

### X'D9' trace entry: fence value before an OLR IPOST/IWAIT

The following figure shows the remaining words of the X'D9' trace entries that are specific to the fence value before an OLR IPOST/IWAIT:

```
TRACE ID    = X'D9'
           word 3 - Can contain the address of the PST
                   to be posted.
           words 4-5 - Contains DMBORFEN.
           words 6-7 - Contains DMBAMFEN.
```

The following table shows the module ID and module subcode values for the X'D9' trace entries that represent the fence value before an OLR IPOST/IWAIT.

Table 30. Module and subcode ID for X'D9': fence value before an OLR IPOST/IWAIT

| Module ID | Module   | Subcode | Meaning                               |
|-----------|----------|---------|---------------------------------------|
| J         | DFSORP70 | X'01'   | IPOST for the OLR I/O fence           |
| J         | DFSORP70 | X'02'   | IWAIT for the OLR action module fence |
| J         | DFSORP70 | X'03'   | IPOST for the OLR I/O fence           |
| J         | DFSORP70 | X'04'   | IWAIT for the OLR action module fence |
| L         | DFSORP40 | X'01'   | IWAIT for the OLR action module fence |
| L         | DFSORP40 | X'02'   | IPOST for the OLR action module fence |
| M         | DFSPCSH0 | X'01'   | IWAIT for the OLR action module fence |
| M         | DFSPCSH0 | X'02'   | IPOST for the OLR action module fence |
| M         | DFSPCSH0 | X'03'   | IWAIT for the OLR action module fence |

Table 30. Module and subcode ID for X'D9': fence value before an OLR IPOST/WAIT (continued)

| Module ID | Module   | Subcode | Meaning                               |
|-----------|----------|---------|---------------------------------------|
| M         | DFSPCSH0 | X'04'   | IPOST for the OLR action module fence |
| O         | DFSDL0C0 | X'01'   | IPOST for the OLR I/O fence           |
| O         | DFSDL0C0 | X'02'   | IWAIT for the OLR I/O fence           |
| R         | DFSDLR00 | X'01'   | IPOST for the OLR action module fence |
| R         | DFSDLR00 | X'02'   | IPOST for the OLR action module fence |
| R         | DFSDLR00 | X'03'   | IWAIT for the OLR action module fence |
| R         | DFSDLR00 | X'04'   | IPOST for the OLR action module fence |
| R         | DFSDLR00 | X'05'   | IPOST for the OLR action module fence |
| R         | DFSDLR00 | X'06'   | IWAIT for the OLR action module fence |
| R         | DFSDLR00 | X'07'   | IWAIT for the OLR action module fence |
| R         | DFSDLR00 | X'08'   | IWAIT for the OLR action module fence |
| S         | DFSDVBH0 | X'01'   | IWAIT for the OLR I/O fence           |
| S         | DFSDVBH0 | X'02'   | IPOST for the OLR I/O fence           |
| V         | DFSDVSM0 | X'01'   | IPOST for the OLR I/O fence           |
| V         | DFSDVSM0 | X'02'   | IPOST for the OLR I/O fence           |

### X'D9' trace entry : next UOR determination

The following figure shows the remaining words of the X'D9' trace entries that are specific to the next UOR determination.

```
TRACE ID    = X'D9'

    word 3 - The total number of UORs performed.
    word 4 - The execution span for this UOR.
    word 5 - The proposed size for the next UOR.
    word 6 - The total bytes moved during this UOR.
    word 7 - The total locks held during this UOR.
```

### X'D9' trace entry: OLR command processing

The following figure shows the X'D9' trace entry definitions used by the Online Reorganization (OLR) command processing:

```
TRACE ID    = X'D9'

    word 0 - byte 1 - X'D9' Online Reorganization (OLR)
                trace entry.
                byte 2 - Zero - not used.
                bytes 3-4 - Trace sequence number.
    word 1 - byte 1 - Module ID.
```

```

        byte 2 - Module subcode.
        byte 3 - Module function.
        byte 4 - FREESTOR error return code.
word 2 - Last 4 bytes of the IMS ID (SCDIMSNM+4)
        processing the command.
words 3-4 - Command VERB (INIT, UPD, TERM, and QRY
        if an type-2 command)
words 5-6 - Operation Manager name ('NONOMCMD' if OLR
        type-1 command.
word 7 - Address of storage not freed if FREESTOR
        failure.

```

For all X'D9' trace entries, the module ID, and usually the module subcode as well, indicate both the meaning of the trace entry and the format of the rest of the trace entry.

The following table shows the module ID values in X'D9' trace entries that represent OLR command processing.

*Table 31. Module and subcode ID for X'D9': OLR command processing*

| Module ID | Module   | Subcode | Meaning                                       |
|-----------|----------|---------|-----------------------------------------------|
| C         | DFSORC00 | X'00'   | OLR type-2 command issued                     |
| C         | DFSORC00 | X'01'   | FREESTOR error during INIT error processing   |
| C         | DFSORC00 | X'02'   | FREESTOR error after sending command response |
| P         | DFSORC10 | X'00'   | OLR type-1 command issued                     |
| P         | DFSORC10 | X'01'   | FREESTOR error during INIT processing cleanup |

### X'D9' trace entry: OLR start

The following figure shows the remaining words of the X'D9' trace entries that are specific to the OLR start.

X'9D' trace entry - words specific to OLR start

```

TRACE ID   = X'D9'

word 3 - The RBA of the cursor in the second CI
        or block.
word 4 - Unused.
word 5 - Unused.
word 6 - Unused.
word 7 - Unused.

```

### X'D9' trace entry: start of a UOR

The following figure shows the remaining words of the X'D9' trace entries that are specific to the start of a UOR.

X'9D' trace entry - words specific to start of UOR

```

TRACE ID   = X'D9'

word 3 - The first four bytes of the last committed
        cursor.
word 4 - The start time of this UOR.
word 5 - The execution span for this UOR.
word 6 - The time that was waited before this
        UOR started.
word 7 - Unused.

```

### X'D9' trace entry: UOR wait for timer

The following figure shows the X'D9' trace entries that are specific to the UOR wait for timer.

X'D9' trace entry - words specific to UOR wait for timer

```
TRACE ID = X'D9'  
  
word 3 - Unused  
word 4 - The start time of this UOR.  
word 5 - The execution span for this UOR.  
word 6 - The time that will be waited before  
         the next UOR starts.  
word 7 - Unused.
```

### X'D9' Trace Entry: OLR Full-Block Logging

```
TRACE ID = X'D9'  
  
Word 3 - Not used  
Word 4 - AMP  
Word 5 - Buffer prefix (IBFPRF for OSAM or IDABUFC for VSAM)  
Word 6 - Block number for OSAM or RBA for VSAM
```

The following table shows the module ID and module subcode values for the X'D9' trace entries that represent the OLR logging of a full-block of database changes in a single X'5050' log record rather than the logging of individual database changes in separate log records.

Table 32. Module and subcode ID for X'D9': OLR full-block logging

| Module ID | Module   | Subcode | Meaning                                                             |
|-----------|----------|---------|---------------------------------------------------------------------|
| F         | DFSDBH20 | X'00'   | After full-block logging during OSAM buffer steal                   |
| H         | DFSDBH30 | X'00'   | After full-block logging during OSAM buffer purge                   |
| S         | DFSDBVH0 | X'03'   | After full-block logging by DL/I buffer handler router before purge |
| V         | DFSDVSM0 | X'03'   | Before full-block logging during VSAM buffer purge                  |
| V         | DFSDVSM0 | X'04'   | After full-block logging during VSAM buffer purge                   |

### X'D9' Trace Entry: OLRK PNDX Store

```
TRACE ID = X'D9'  
  
Word 3 - OLRK entry address  
Word 4 - Root RBA of the primary index entry.  
Word 5 byte 1 - x'80' entry for primary index entry or VSAM)  
         byte 2 - x'80' queued onto chain by OLR
```

### X'D9' Trace entry: OLRK ILE Store

```
TRACE ID = X'D9'  
  
Word 3 - OLRK entry address  
Words 4,5 - Key of ILDS record  
Word 6 byte 1 - segment code  
         byte 2 - x'40' entry for ILDS entry  
         byte 3 - x'80' queued onto chain by OLR
```

### X'D9' Trace entry: OLRK ILE Write

```
TRACE ID    = X'D9'  
  
Word 3 - OLRK entry address  
Word 4,5 - Key of ILDS record  
Word 6 byte 1 - segment code  
          byte 2 - x'40' entry for ILDS entry  
          byte 3 - x'40' written to KSDS by VSAM interface  
                x'20' deleted off chain by OLR
```

### X'FB' Trace entry: PSTSTLOR.

INSERT LOGICAL RECORDS (KSDS) to the primary index database or INSERT LOGICAL RECORDS (KSDS) to the ILDS database for HALDB integrated online reorganization. See the previous OLRK ILE/ILDS Store/Write trace entries that are associated with this trace entry.

```
TRACE ID    = X'FB'  
  
Word 3 - Unused  
Word 4 - Unused  
Word 5 - Unused  
Word 6 - Unused  
Word 7 - Unused
```

### X'DA' trace entry

The X'DA' trace entry is shown.

### X'DA' trace entry

```
TRACE ID    = X'DA'  
  
word 0 - byte 1 - X'DA' - VSAM JRNAD or UPAD exit  
        byte 2 - PST number  
        bytes 3-4 - Trace sequence number  
word 1 - Word 3 of JRNAD or UPAD parameter list  
word 2 - Word 4 of JRNAD or UPAD parameter list  
word 3 - Word 5 of JRNAD or UPAD parameter list  
word 4 - byte 1 - JRNAD or UPAD code (For an explanation of  
        these codes, see note 3 below)  
word 4 bytes 2-4 - AMB address  
word 5 - PLH STACK or VSAM FOOTSTEPS  
        (see notes 1 - 4 below)  
word 6 - PLH STACK or VSAM FOOTSTEPS  
        (see notes 1 - 4 below)  
word 7 - PLH STACK or VSAM FOOTSTEPS  
        (see notes 1 - 4 below)
```

### Notes:

1. If the trace contains the PLH stack entries, these entries are the module addresses of the last five VSAM record management modules that had control. If the trace contains the VSAM footsteps, each VSAM footprint is a 1 byte entry which contains VSAM diagnostic information.
2. The PLH footsteps contain 1 byte of VSAM diagnostic data and is passed back to IMS in order from last to first footprint.
3. This information might be valuable to the VSAM support representatives if you need their assistance.
4. For an explanation of these codes, see the following table.

Table 33. JRNAD and UPAD codes for X'DA' trace entry

| Code  | Code (hexadecimal) | Meaning                                 |
|-------|--------------------|-----------------------------------------|
| JRNAD | 0C                 | Logical records to be shifted in a KSDS |
| JRNAD | 10                 | Cannot occur                            |

Table 33. JRNAD and UPAD codes for X'DA' trace entry (continued)

| Code  | Code<br>(hexadecimal) | Meaning                                          |
|-------|-----------------------|--------------------------------------------------|
| JRNAD | 14                    | Cannot occur                                     |
| JRNAD | 20                    | Control area split starting in a KSDS            |
| JRNAD | 24                    | Control interval read error                      |
| JRNAD | 28                    | Control interval write error                     |
| JRNAD | 2C                    | Control interval to be written                   |
| JRNAD | 30                    | Control interval to be read and marked exclusive |
| JRNAD | 34                    | Control interval ownership to be established     |
| JRNAD | 38                    | Control interval to be marked exclusive          |
| JRNAD | 3C                    | Create a new control interval                    |
| JRNAD | 40                    | Release exclusive use of control interval        |
| JRNAD | 44                    | Mark control interval prefix invalid             |
| JRNAD | 48                    | Control interval read completed                  |
| JRNAD | 4C                    | Control interval write completed                 |
| JRNAD | 50                    | CI or CA split                                   |
| JRNAD | 54                    | Control area reclaim start                       |
| JRNAD | 58                    | Control area reclaim end                         |
| JRNAD | 5C                    | Control area reclaim interrupted                 |
| JRNAD | 60                    | Control area reclaim recovery start              |
| JRNAD | 64                    | Control area reclaim recovery end                |
| JRNAD | 68                    | Start of reuse reclaimed control area            |
| JRNAD | 6C                    | End of reuse reclaimed control area              |
| UPAD  | 00                    | Wait requested on I/O or defer                   |
| UPAD  | 04                    | Post ECB (XMEM only)                             |

### X'DB' through X'FA' trace entry

The X'DB' through X'FA' trace entries are shown.

### The X'DB' through X'FA' trace entries

**TRACE ID = X'DB' - X'FA'**

```

word 0 - byte 1 - X'DB' through X'FA' PSTFNCTN - Buffer handler trace -
                This is the function
                from X'DB' thru X'FA' for which the trace
                was written (see note 1 below).
                byte 2 - PST number (see note 2 below)
                bytes 3-4 - Trace sequence number
word 1 - bytes 1-2 - PSTDMBNM - DMB number. This field
                indicates which DMB is being used.
                The DMB directory (DDIR) gives the
                first DMB.
                byte 3 - PSTDCBNM - DCB number
                byte 4 - PSTRTCDE - Usually
                indicates an error if nonzero. If an error,
                PSTDATA may contain residual data from the

```



last call (see note 3 below)

word 2 - byte 1 - PSTTRMID - ID of the module calling the buffer handler  
 byte 2 - PSTTRMSC - Subcode of the module calling the buffer handler  
 byte 3 - PSTBHFLG - DL/I buffer handler flags  
 byte 4 - PSTSUBCD - Buffer handler internal work byte

word 3 - PSTDSGA - Address of the DSG

word 4 - PSTDATA - Address in real storage of the requested data. May point to the last retrieved data address in a call (failed abend) (see note 4 below).

word 5 - PSTBUFFA - Address of buffer header. OSAM uses IBFPRF DSECT. VSAM uses IDABUFC DSECT.

word 6 - PSTISAMW - Work area

word 7 - PSTBYTNM - Relative byte number of data or block number (see note 5 below).

**Notes:**

1. The IMS internal function that was being performed.
2. Use only the trace entries with the correct PST number.
3. Shows how the call completed. (X'00' means successful completion.)
4. Shows where the requested data is located in core only if the call completed successfully.
5. The RBA or block number that the call requested.

If the call failed, the PSTDATA field might contain the address of the last segment successfully retrieved.

Example: PSTRTCDE = X'04' (RBA past end of data set).

**Related reference**

“Space management and buffer handler module trace IDs” on page 199

In space management and DL/I buffer handler trace entries, a 1-byte module ID identifies the calling module. A 1-byte subcode identifies the specific call within the module.

**Database function codes**

The DL/I function codes are shown.

**Buffer handler function codes**

PSTFNCTN is located at PST + X'1C4'.

The following table shows the buffer handler function codes.

*Table 34. Buffer handler function codes*

| Code (hex) | PSTFNCTN | Caller's request function       |
|------------|----------|---------------------------------|
| DB         | PSTSRCHP | Search pool for record in range |
| DD         | PSTRELLR | Release record ownership        |
| DE         | PSTRSTAT | Retrieve buffer pool statistics |
| DF         | PSTVERFY | Verify VSAM data set            |
| E0         | PSTVPUT  | Put record to VSAM data set     |
| E1         | PSTBKLC  | Block Locate                    |
| E2         | PSTBYLCT | Byte Locate                     |
| E3         | PSTISRCH | Not used                        |
| E4         | PSTIESDS | Create new ESDS/OSAM LRECL      |
| E5         | PSTPGUSR | Write LRECLS for user (PURGE)   |

Table 34. Buffer handler function codes (continued)

| Code (hex) | PSTFNCTN | Caller's request function                                      |
|------------|----------|----------------------------------------------------------------|
| E6         | PSTBFALT | Mark record altered                                            |
| E9         | PSTFBSPC | Free space in buffer pool (BFPL)                               |
| EA         | PSTOWTCK | Perform background write function                              |
| EB         | PSTBYALT | Byte locate and mark altered                                   |
| EC         | PSTBFMPT | Mark buffers empty (BFPL)                                      |
| ED         | PSTCHKPT | Checkpoint                                                     |
| EE         | PSTSTAPG | Batch STAE purge at ABEND                                      |
| EF         | PSTERRPG | Purge user for I/O error check                                 |
| EF         | PSTFRWRT | OSAM buffer forced write                                       |
| F0         | PSTSTLBG | Retrieve first LRECL by key                                    |
| F1         | PSTERASE | Erase logical record                                           |
| F2         | PSTSTLEQ | Retrieve by key EQ or GT                                       |
| F3         | PSTSTLCI | Retrieve key EQ or GT - repair CI                              |
| F4         | PSTSTLIS | Retrieve by key REC to chain from insert logical record (KSDS) |
| F5         | PSTBXFER | RSR DTT BQEL transfer                                          |
| F6         | PSTBPURG | RSR DTT Purge/Release BQEL                                     |
| F7         | PSTRSIAB | Reset invalidate all buffers trigger                           |
| F9         | PSTCPYGU | Position by key for Image Copy                                 |
| FA         | PSTCPYGN | Get next record for Image Copy                                 |

The following table shows the space management function codes.

Table 35. Space management function codes

| Code (hex) | PSTFNCTN | Caller's request function                                                                                                   |
|------------|----------|-----------------------------------------------------------------------------------------------------------------------------|
| 31         | PSTGTSPC | Get space for the segment                                                                                                   |
| 32         | PSTFRSPC | Free space for the segment                                                                                                  |
| 34         | PSTGTRAP | Get space close to root anchor PSTBYTNM. Request to turn off bit map bit. Refer to label PSTBTMPF.                          |
| 35         | PSTGZIDL | Get local serialization as a service to LRH00 during /ERE when IRLM as SLM is not there.                                    |
| 36         | PSTRZIDL | Release local serialization                                                                                                 |
| B1         | PSTGTSPH | Request for space at BLOCK and OFFS B2-B5 are reserved for tracing PSTDATA. PSTOFFSET must point to the location requested. |

The following table shows the Open/Close function codes.

*Table 36. Open/Close function codes*

| <b>Code (hex)</b> | <b>PSTFNCTN</b> | <b>Caller's request function</b>                                                         |
|-------------------|-----------------|------------------------------------------------------------------------------------------|
| 00                | PSTOCCLS        | This is a close call. This is the absence of PSTOCOPN (X'08') or PSTOCOPN is reset.      |
| 01                | PSTOCDMB        | The DDIR address is in register 2                                                        |
| 02                | PSTOCPCB        | The PCB address is loaded from PSTDBPCB to registers 1                                   |
| 04                | PSTOCALL        | OPEN/CLOSE all DMBs in the system                                                        |
| 08                | PSTOCOPN        | This is an OPEN call                                                                     |
| 0C                |                 | Combine X'04' and X'08'                                                                  |
| 10                | PSTOCDCB        | OPEN/CLOSE DCB PSTDSGA = DSG                                                             |
| 20                | PSTOCLD         | Open for load                                                                            |
| 21                | PSTOCDMA        | CLOSE and UNAUTHORIZE DMB address of DDIR in register 2                                  |
| 40                | PSTOCDSG        | OPEN/CLOSE DSG PSTDSGA = DSG                                                             |
| 80                | PSTOCBAD        | The PSTOCBAD (X'80') is set to indicate to the caller that the requested function failed |

The following table shows the index maintenance function codes.

*Table 37. Index maintenance function codes*

| <b>Code (hex)</b> | <b>PSTFNCTN</b> | <b>Caller's request function</b>             |
|-------------------|-----------------|----------------------------------------------|
| A0                | PSTXMDLT        | Index maintenance for segment to be deleted  |
| A1                | PSTXMRPL        | Index maintenance for segment to be replaced |
| A2                | PSTXMISR        | Index maintenance for segment to be inserted |
| A3                | PSTXMUNL        | Index maintenance for segment to be unloaded |

The following table shows the block loader function codes.

*Table 38. Block loader function codes*

| <b>Code (hex)</b> | <b>PSTFNCTN</b> | <b>Caller's request function</b> |
|-------------------|-----------------|----------------------------------|
| 00                | PSTRSVDB        | Reserve database resources       |
| 01                | PSTDMBRD        | Read DMB from ACBLIB             |
| 02                | PSTPSBRD        | Read PSB from ACBLIB             |

Table 38. Block loader function codes (continued)

| Code (hex) | PSTFNCTN | Caller's request function                  |
|------------|----------|--------------------------------------------|
| 03         | PSTINTRD | READ INTENT and DMB name lists from ACBLIB |
| 04         | PSTENQ   | PI Processing is required                  |
| 40         | PSTEREFF | Free DB resources (SCHED failed)           |
| 80         | PSTFREDB | Free DB resources (termination)            |

### Buffer handler return codes

The buffer handler return codes, subcodes, and definitions are listed and defined.

### Buffer handler return codes

The following table describes the buffer handler return codes.

Table 39. Buffer handler return codes

| Return code | Subcode | Definition                                       |
|-------------|---------|--------------------------------------------------|
| PSTCLOK     | X'00'   | Everything correct                               |
| PSTGTDS     | X'04'   | RBN beyond data set                              |
| PSTRDERR    | X'08'   | Permanent read error                             |
| PSTNOSPC    | X'0C'   | No more space in data set                        |
| PSTBDCAL    | X'10'   | Illegal call                                     |
| PSTENDDA    | X'14'   | End of data set encountered — no record returned |
| PSTNDTFD    | X'18'   | Requested record cannot be found                 |
| PSTNWBLK    | X'1C'   | New block created in buffer pool                 |
| PSTNPLSP    | X'20'   | Insufficient space in pool.                      |
| PSTRMNT     | X'24'   | User must terminate, no space in pool.           |
| PSTDUPLR    | X'28'   | Logical record already in KSDS.                  |
| PSTWRERR    | X'2C'   | Permanent write error.                           |
| PSTBUFIN    | X'30'   | Buffer invalidate.                               |
| PSTBIDIN    | X'34'   | Unable to acquire BID lock.                      |
| PSTPDERR    | X'38'   | Unable to locate DDIR/PDIR entry.                |
| PSTNOSTO    | X'3C'   | Storage not available.                           |
| PSTRRERR    | X'40'   | CF read and register error.                      |
| PSTCURER    | X'44'   | Space management OLR cursor error.               |
| PSTCLSDS    | X'48'   | Attempt to access a closed data set.             |

## Space management and buffer handler module trace IDs

In space management and DL/I buffer handler trace entries, a 1-byte module ID identifies the calling module. A 1-byte subcode identifies the specific call within the module.

## Space management and DL/I buffer handler trace entries

The calling module places the module ID in field PSTTRMID and the subcode in field PSTTRMSC before making the call. The DL/I buffer handler and space management then move these PST fields to the appropriate traces.

The PSTTRMSC module subcodes are 0 through 9 and A through Z. If you need to find the point in the module where the call was made, look for the TIDSCx label that corresponds to the module subcode. Subcode 0 corresponds to label TIDSC0, subcode 1 to label TIDSC1, subcode A to TIDSCA, and so on.

The following table describes the ID, the calling module, and the module function

*Table 40. Space management and DL/I buffer handler module trace IDs*

| <b>ID label</b> | <b>Module ID</b> | <b>Calling module</b> | <b>Module function</b>         |
|-----------------|------------------|-----------------------|--------------------------------|
| TIDDLA00        | A                | DFSDLA00              | Call analyzer                  |
| TIDDLAS0        | A                | DFSDLAS0              | Call analyzer SSA              |
| TIDORA00        | A                | DFSORA00              | OLR data set creation/deletion |
| TIDZDC00        | A                | DFSZDC00              | GSAM Controller                |
| TIDORA10        | B                | DFSORA10              | OLR data set information       |
| TIDZDI00        | B                | DFSZDI00              | GSAM Initialization            |
| TIDORC00        | C                | DFSORC00              | OLR OM command processor       |
| TIDZDI20        | C                | DFSZDI20              | GSAM Initialize GB             |
| TIDDLDC0        | D                | DFSDLDC0              | DELETE/REPLACE                 |
| TIDORA20        | D                | DFSORA20              | Create data sets for OLR       |
| TIDZDI30        | D                | DFSZDI30              | GSAM Buffering Initialization  |
| TIDFLST0        | E                | DFSFLST0              | Batch STAE exit                |
| TIDORA30        | E                | DFSORA30              | Delete data sets for OLR       |
| TIDZD110        | E                | DFSZD110              | GSAM BSAM OPEN / CLOSE         |
| TIDLRH00        | F                | DFSLRH00              | LOCK request handler           |
| TIDZD150        | F                | DFSZD150              | GSAM VSAM OPEN / CLOSE         |
| TIDORA40        | G                | DFSORA40              | Performs OLR IDCAMS            |
| TIDSDLB0        | G                | DFSSDLB0              | IRLM status routine            |
| TIDZD210        | G                | DFSZD210              | GSAM BSAM I/O                  |
| TIDFXC50        | H                | DFSFXC50              | DB SYNC point                  |
| TIDZD250        | H                | DFSZD250              | GSAM VSAM I/O                  |
| TIDDT400        | I                | DFSDT400              | RSR DB Tracking                |
| TIDORP60        | I                | DFSORP60              | OLR interfaces to DBRC         |
| TIDZD310        | I                | DFSZD310              | GSAM Buffer I/O                |
| TIDDT500        | J                | DFSDT500              | RSR DB MILESTONE PURGE         |

Table 40. Space management and DL/I buffer handler module trace IDs (continued)

| <b>ID label</b> | <b>Module ID</b> | <b>Calling module</b> | <b>Module function</b>               |
|-----------------|------------------|-----------------------|--------------------------------------|
| TIDDDLE1        | K                | DFSDDLE0              | LOAD INSERT function                 |
| TIDZSR00        | K                | DFSZSR00              | GSAM Extended checkpoint             |
| TIDDDLE0        | L                | DFSDDLE0              | LOAD INSERT function                 |
| TIDORP40        | L                | DFSORP40              | OLR termination and cleanup          |
| TIDZSR10        | L                | DFSZSR10              | GSAM Restart positioned              |
| TIDPCSH0        | M                | DFSPCSH0              | Partitioning Common Services Handler |
| TIDORP20        | N                | DFSORP20              | OLR cursor and commit manager        |
| TIDDLOC0        | O                | DFSDLOC0              | OPEN/CLOSE                           |
| TIDDLOV0        | O                | DFSDLOV0              | LOGICAL/VIRTUAL OPEN                 |
| TIDDCAP0        | P                | DFSDCAP0              | Full-Function Data capture           |
| TIDORC10        | P                | DFSORC10              | OLR type-1 command processor         |
| TIDDDUI0        | Q                | DFSDDUI0              | DUI processor                        |
| TIDDLR00        | R                | DFSDLR00              | RETRIEVE function                    |
| TIDHD00         | S                | DFSDHD00              | Space Manager (INIT procedure)       |
| TIDVBH0         | S                | DFSDVBH0              | Buffer handler router                |
| TIDFRSP0        | S                | DFSFRSP0              | Space Manager (free space)           |
| TIDGGSP0        | S                | DFSGGSP0              | Space Manager (GET space)            |
| TIDMMUD0        | S                | DFSMUD0               | Space Manager (bit map update)       |
| TIDRCHB0        | S                | DFSRCHB0              | Space Manager (SEARCH block)         |
| TIDRRHM0        | S                | DFSRRHM0              | Space Manager (SEARCH bit map)       |
| TIDRRHP0        | S                | DFSRRHP0              | Space Manager (buffer pool)          |
| TIDTOBH0        | T                | DFSTOBH0              | I/O toleration buffer handler caller |
| TIDTOCLO        | T                | DFSTOCLO              | I/O toleration DB close              |
| TIDDPSB0        | U                | DFSDPSB0              | PSB generator module                 |
| TIDURDB0        | U                | DFSURDB0              | Database Recovery utility            |
| TIDURGPO        | U                | DFSURGPO              | Database Prefix Update utility       |
| TIDURGS0        | U                | DFSURGS0              | Database Scan utility                |
| TIDBACK0        | V                | DFSBB000              | BATCH backout utility                |
| TIDDVSM0        | V                | DFSDVSM0              | VSAM interface                       |
| TIDURRLO        | V                | DFSURRLO              | HISAM Reorganization Reload utility  |
| TIDURULO        | V                | DFSURULO              | HISAM Reorganization Unload utility  |
| TIDUCPDO        | W                | DFSUCPDO              | UCF DB ZAP processor utility         |
| TIDUCPE0        | W                | DFSUCPE0              | UCF subroutines utility              |
| TIDUICCO        | W                | DFSUICPO              | Online Image Copy utility            |

Table 40. Space management and DL/I buffer handler module trace IDs (continued)

| ID label | Module ID | Calling module                   | Module function             |
|----------|-----------|----------------------------------|-----------------------------|
| TIDDXMTO | X         | DFSDXMTO                         | Index maintenance           |
| TIDRBOIO | Y         | DFSRBOIO                         | Backout RESTART/DYN/BATCH   |
| TIDRDBC0 | Z         | DFSRDBC0                         | Database backout control    |
| TIDPSELO | M         | DFSDBH20<br>DFSDBH30<br>DFSDVSMO | Partition Selection Handler |

**Example of a DL/I trace**

The following example shows a DL/I trace. The trace entries show two GHU calls. All calls use Program Specification Table (PST) 01. When activities for different PSTs are intermixed in the trace table, you need to examine only the entries for the PST that you are interested in.

```

FUNCTION          WORD 0      WORD 1      WORD 2      WORD 3      WORD 4      WORD 5      WORD 6      WORD
7
* DL1 TRACE TABLE - DATE 89039 TIME 17450600 SKIP 0000 TOTAL SKIP 00000000 RECORD NUMBER 00000007
ANALYZE CALL     AA01008A  00008DE0  GHU          0A0D60    03080800   00004892   00004000
0008F200        .....GHU .....K...2.
VSAM EXIT        DA01008B  0272FA60  06000000    00002400   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....B.>...W.>&...
PSTBYLCT        E201008C  00040100  D2014400    000A101C   0273720C   0272FA60   0274E45E   0000260C
S.....K.....U;....
VSAM EXIT        DA01008D  0272FAB0  06000000    00004800   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....B.>...W.>&...
PSTBYLCT        E201008E  00030100  D2014400    000A205C   02739092   0272FAB0   0274E45E   00004892
S.....K.....*...K.....U;...K
VSAM EXIT        DA01008F  0272FB50  06000000    00002400   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....&...B.>...W.>&...
PSTBYLCT        E2010090  00030100  D2014400    000A205C   0273D354   0272FB50   0274E45E   00002754
S.....K.....*...L.....&...U;....
PSTBYLCT        E2010091  00030100  D2014400    000A205C   0273D11C   0272FB50   0274E45E   0000251C
S..J....K.....*...J.....&...U;....
PSTBYLCT        E2010092  00030100  D2014400    000A205C   0273D354   0272FB50   0274E45E   00002754
S..K....K.....*...L.....&...U;....
PSTBYLCT        E2010093  00030100  D2014400    000A205C   0273D11C   0272FB50   0274E45E   0000251C
S..L....K.....*...J.....&...U;....
PSTBYLCT        E2010094  00030100  D2014400    000A205C   0273D020   0272FB50   0274E45E   00002420
S..M....K.....*...&...U;....
VSAM EXIT        DA010095  0272FAB0  06000000    00004800   34B95982   B96E24B9   BCE6BA6E
50B9AE68        ..N.....&...B.>...W.>&...
PSTBYLCT        E2010096  00030100  D2014400    000A205C   02739092   0272FAB0   0274E45E   00004892
S..O....K.....*...K.....U;...K
VSAM EXIT        DA010097  0272FB50  06000000    00002400   34B95982   B96E24B9   BCE6BA6E
50B9AE68        ..P.....&...B.>...W.>&...
PSTBYLCT        E2010098  00030100  D2014400    000A205C   0273D354   0272FB50   0274E45E   00002754
S..Q....K.....*...L.....&...U;....
ANALYZE CALL     AA010099  00008DE0  GHU          0A0D60    03280800   00004892   00004000
0008F200        ..R.....GHU .....K...2.
FUNCTION          WORD 0      WORD 1      WORD 2      WORD 3      WORD 4      WORD 5      WORD 6      WORD
7
VSAM EXIT        DA01009A  0272FA60  06000000    00002400   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....B.>...W.>&...
PSTBYLCT        E201009B  00040100  D2014400    000A101C   0273720C   0272FA60   0274E45E   0000260C
S.....K.....U;....
VSAM EXIT        DA01009C  0272FAB0  06000000    00004800   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....B.>...W.>&...
PSTBYLCT        E201009D  00030100  D2014400    000A205C   02739092   0272FAB0   0274E45E   00004892
S.....K.....*...K.....U;...K
VSAM EXIT        DA01009E  0272FB50  06000000    00002400   34B95982   B96E24B9   BCE6BA6E
50B9AE68        .....&...B.>...W.>&...
PSTBYLCT        E201009F  00030100  D2014400    000A205C   0273D354   0272FB50   0274E45E   00002754
S.....K.....*...L.....&...U;....
PSTBYLCT        E20100A0  00030100  D2014400    000A205C   0273D11C   0272FB50   0274E45E   0000251C
S.....K.....*...J.....&...U;....
PSTBYLCT        E20100A1  00030100  D2014400    000A205C   0273D354   0272FB50   0274E45E   00002754
S.....K.....*...L.....&...U;....
PSTBYLCT        E20100A2  00030100  D2014400    000A205C   0273D11C   0272FB50   0274E45E   0000251C
S..S....K.....*...J.....&...U;....
PSTBYLCT        E20100A3  00030100  D2014400    000A205C   0273D020   0272FB50   0274E45E   00002420
S..T....K.....*...&...U;....
VSAM EXIT        DA0100A4  0272FAB0  06000000    00004800   34B95982   B96E24B9   BCE6BA6E
50B9AE68        ..U.....&...B.>...W.>&...
PSTBYLCT        E20100A5  00030100  D2014400    000A205C   02739092   0272FAB0   0274E45E   00004892
S..V....K.....*...K.....U;...K

```

```

VSAM EXIT      DA0100A6  0272FB50  06000000  00002400  34B95982  B96E24B9  BCE6BA6E
50B9AE68      ...W...&.....B.>...W.>&...
PSTBYLCT      E20100A7  00030100  D2014400  000A205C  0273D354  0272FB50  0274E45E  00002754
S..X...K.....*..L....&..U;....

```

### Related reference

[“X'DB' through X'FA' trace entry” on page 194](#)

The X'DB' through X'FA' trace entries are shown.

## Delete/Replace - DL/I trace information

The DELETE/REPLACE module provides meaningful information when abnormal conditions arise leading directly to errors detected by Delete/Replace. This information can be found in the Delete/Replace work area (DLTWA).

Abends initiated by the Delete/Replace module (780, 796, 797, 798, 799, 802, 803, 804, 806, 807, 808, and 811) are traced in the DL/I trace table in a series of entries identified by an X'C4' in the first byte (TRACE FUNCTION CODE).

The first X'C4' entry in the series is provided by the routine that encountered the problem. Each additional entry is provided by the routine that called the routine which in turn wrote the prior entry in the table. Examining these entries in reverse sequence reveals the order in which control was passed from one routine to another.

You can obtain a complete description of the trace table entry for Delete/Replace by assembling the following lines of code:

```

DSECTS  CSECT
        DFSDLDC  FUNC=DSECTS
        END

```

The second word in the Delete/Replace trace entry (called Entry1) uniquely identifies a Delete/Replace abend, and should be used by IBM and customers when submitting APARs for better problem description. In some cases, the Entry1 word from the next trace entry along with the first Entry1 word uniquely identifies the abend. The Entry1 format is:

```

BYTE 0  ID of routine supplying this entry
      1  ID of routine that encountered error
      2  Subcode number of abend if multiples
      3  Internal code for abend

```

Each routine within the Delete/Replace module has a unique 1-byte identification number. The IDs can be obtained from the assembly listings of each of the four source modules which make up the Delete/Replace call. In general they are:

```

X'01' to X'1F'—control and common subroutines (DFSDLDC0)
X'20' to X'3F'—delete routines (DFSDLDD0)
X'40' to X'5F'—replace routines (DFSDLDR0)
X'60' to X'7F'—DLTWA build routines (DFSDLDW0)

```

Use the Entry1 word (the second word in the trace entry) when relating to a Delete/Replace problem in IMS with IBM Software Support.

## Retrieve trace

When an application program executes and a problem occurs (such as damaged data or unexpected results), you can use the Retrieve trace records to see how IMS responded to various calls in the application.

### To set the Retrieve trace

To set the Retrieve trace on, use either of the following methods:

- At initialization time, IMS always turns the Retrieve trace on, except for batch.



- For DB/DC and DBCTL environments, use the **/TRACE SET ON TABLE RETR** command. If you start the DL/I trace by using the **/TRACE SET ON TABLE DLI** command, the Retrieve trace is not automatically turned on.

**Note:** The Retrieve trace cannot be turned on if the DL/I trace is not active.

To determine if the trace is in the dump, check field PSTDLR1 in the PST.

**X'0700'**

Indicates the trace is on.

**X'07FC'**

Indicates the trace is off.

Field PSTRTVTR of the PST contains the address of the trace table. The byte at PSTRTNDX contains the offset to the next entry in the table.

Every time an application issues a get or insert call, the retrieve module (DFSDLR00) is called. This module is very large and contains many subroutines. By looking at the Retrieve trace, you can see the flow of control through the various subroutines of the retrieve module. As each subroutine calls another, a 2-byte hexadecimal entry is inserted into the trace table. (Byte 1 of the trace entry is the ID of the calling subroutine; byte 2 is the ID of the subroutine that is called.)

The Retrieve trace table is filled from beginning to end. When the table becomes full, tracing starts at the beginning of the table, overlaying each old entry with the new entry.

The first entry in the trace table for a call is X'F1', which is paired with entries: X'2F' (UNQL), X'30' (ROOTISRT), or X'31' (QUAL). The presence of any of these entries indicates the beginning of a trace entry for a retrieve call.

Field JCBRTVTR in the JCB also contains Retrieve trace information. JDBRTVTR contains the offsets to the initial entries in the trace table for the previous four DL/I calls that are associated with a database. The offset to the last call is in the low-order byte, and all offsets are shifted left at the start of each new call.

**Example of Retrieve Trace**

The execution of an application results in an error message that indicates damaged data. You can refer to the Retrieve trace table and interpret the entries in order to determine if the problem is caused by:

- An application error
- A database design error
- An internal IMS DB problem
- An IMS system problem related to pointers

If you determine that the problem was caused by an application or database design error, you can use the Retrieve trace to debug and resolve the problem. Otherwise, you can do a keyword search. If the search results in a large number of problems, you can reduce the number of problems by including the name of the subroutine (listed in the following table) that you found in the Retrieve trace table.

*Table 41. The subroutines of the retrieve module (DFSDLR00)*

| Hex ID | Subroutine title | Subroutine description                                                                                    |
|--------|------------------|-----------------------------------------------------------------------------------------------------------|
| 01     | BLDVKEY          | Builds alternate parent's concatenated key in work area.                                                  |
| 02     | CSIIGEXT         | Reads root based on SSA qualification. If found, GE at level one. If not found, GE at level 0.            |
| 03     | DIVRSETU         | Position (DIV) was not found at this level. Sets off EOC and sets on not posted first child and siblings. |
| 04     | ENQDQ            | Handles all enqueue and dequeue for retrieve.                                                             |
| 05     | FNDLPNQ          | Final physical root of LP SDB and enqueue it.                                                             |

Table 41. The subroutines of the retrieve module (DFSDLR00) (continued)

| Hex ID | Subroutine title | Subroutine description                                                                                           |
|--------|------------------|------------------------------------------------------------------------------------------------------------------|
| 06     | FORTHISL         | Tries to get a segment that satisfies the call at this level or higher.                                          |
| 07     | GEEXIT           | Publishes GE status code or GB (if root SDBEOC on).                                                              |
| 08     | GETPSDB          | Gets the PSDB of the segment pointed to by JCBACSC.                                                              |
| 09     | GETPRIME         | Issues request for SETL to retrieve next higher root in database.                                                |
| 0A     | STLALTPS         | Processes request for data by key when an alternate processing sequence is used.                                 |
| 0B     | ISRTMPOS         | While positioning for insert, a matching segment was found; checks if permissible.                               |
| 0C     | ISRTPOS          | Checks for LC insert to locate alternate parent, validate insert, or establish position on alternate twin chain. |
| 0D     | ISRTVER          | Verifies segment in POSP points to segment in SDBPOSN for HDAM and HIDAM organizations.                          |
| 0E     | KDTEST           | Compares value in SSA to value in segment or to key feedback for requalification.                                |
| 0F     | LCPTRTST         | Used by CC=L processing to use PCL pointer, if any.                                                              |
| 10     | LTW              | Main driver for requalification to determine the acceptability of current position.                              |
| 11     | LTWLRTN          | Used by CC=L processing to see if on last or should use PCL pointer or continue trying (HS).                     |
| 12     | LTWLTST          | Used by CC=L processing to find the last segment.                                                                |
| 13     | MOVEKEY          | Moves key from segment to PCB key feedback.                                                                      |
| 14     | MVSEGUSE         | Moves the requested segment from the I/O area to the user area.                                                  |
| 15     | POSTCHLD         | Captures child RBNs from input SDB prefix and places in SDBPOSN of dependent SDBs.                               |
| 16     | POSTME           | Places search starting position for segment in SDB.                                                              |
| 17     | POSTTRY          | Unqualified GN has found a segment. Posts the position and key.                                                  |
| 18     | POSTCURP         | Moves position from JCB work words into SDB and sets post code.                                                  |
| 19     | POSTSDBN         | Stores location of next segment on chain in JCB work words.                                                      |
| 1A     | READCUR          | Locates current entry in passes SDB.                                                                             |
| 1B     | RDLPCONK         | Locates logical parent using its key.                                                                            |
| 1C     | READNXT          | Locates next segment from passes SDB.                                                                            |
| 1D     | RDPHYPR          | Locates physical pair of segments when passed SDB address of its pair.                                           |
| 1E     | RESETMP          | Initializes for unqualified call.                                                                                |
| 1F     | RESETQMP         | Compares previous call position in level table to current qualification where POS=M.                             |
| 20     | SCDCRSCK         | Not first LR crossed and concatenated segment ISRT, builds concatenated key of LC physical parent.               |

Table 41. The subroutines of the retrieve module (DFSDLR00) (continued)

| Hex ID | Subroutine title | Subroutine description                                                                        |
|--------|------------------|-----------------------------------------------------------------------------------------------|
| 21     | SETEOC           | Sets EOC in requested SDB. If logical parent enqueues outstanding, locates each and dequeues. |
| 22     | SETL             | Provides interface to buffer handler for all external data requests.                          |
| 23     | SETLBG           | Issues request for SETL to get first root in database.                                        |
| 24     | SETPVEOC         | Sets EOC on previous SDBs in the hierarchy having the same parent as the passed SDB.          |
| 25     | SSAEVAL          | Examines a segment to see if it satisfies the qualification.                                  |
| 26     | SETCHEOC         | Sets on SDBEOC of dependent SDBs.                                                             |
| 27     | STECHISB         | Sets SDBEOC on for input SDB and siblings having same physical parent.                        |
| 28     | SETLMIKY         | SETL to find key equal to or greater than key determined as minimum value for SSA.            |
| 29     | STNPHISB         | Sets EOC (if in use) and not posted for siblings of input SDB.                                |
| 2A     | THISLVOK         | Found one at this level that satisfies the call. Uses it and checks for more levels in call.  |
| 2B     | UNQGN            | Gets next sensitive segment without violating parentage.                                      |
| 2C     | VLEXP            | Processes variable length segment and user data compaction.                                   |
| 2D     | WIPEDN           | Clears level table below level passed to bottom of table or below entry currently cleared.    |
| 2E     | XDFTEST          | Qualification is secondary index. Checks index entries to validate the position.              |
| 2F     | UNQL             | Master driver for calls without SSAs.                                                         |
| 30     | ROOTISRT         | Routine for positioning to insert at physical root of database.                               |
| 31     | QUAL             | Driver for qualified retrievals.                                                              |
| 32     | HSAMRTN          | HSAM I/O interface routine.                                                                   |
| 33     | RETRY            | Retry routine for processing option GOT.                                                      |
| 34     | ISRTCHCK         | Use two keys in DSG for root insert.                                                          |
| 35     | VALIDATE         | Validate an EPS.                                                                              |
| 36     | PARTCKRC         | Check results of the validate.                                                                |
| 37     | HDTARGET         | PHDAM/HDAM get a key equal or greater.                                                        |
| 38     | HDNEXT           | PHDAM/HDAM get next.                                                                          |
| 39     | HDTARGET         | PHDAM/HDAM get a first.                                                                       |
| 3A     | OLRTRACE         | Trace IWAIT/IPOST for OLR fence.                                                              |
| F1     | INIT             | Initialization.                                                                               |

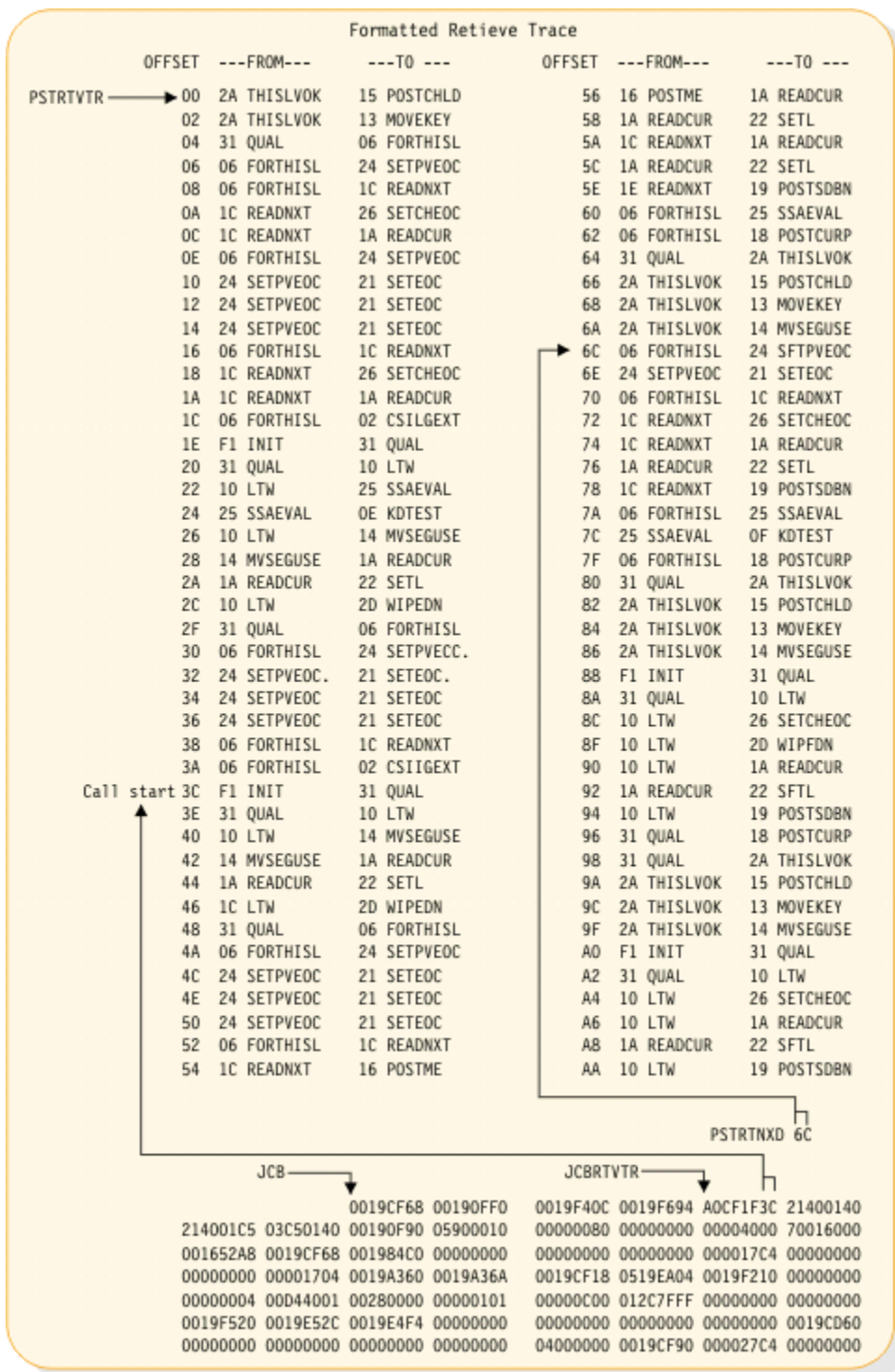


Figure 62. Example of a retrieve trace

## Online Recovery Manager trace

The Online Recovery Manager trace (ORTT) records the control flow that is related to **/RECOVER** command processing.

## Starting the Online Recovery Manager trace

The **/TRACE SET ON TABLE ORTT** command activates the trace and sends the entries to an internal table.

You can format the table using the Offline Dump Formatter under IPCS, using either the VERBX command or the IMS Dump Formatter panels.

If a SNAP dump is taken, the table is formatted as part of the IMS dump.

If you add the OPTION LOG parameter to the **/TRACE** command, IMS sends the output to an external data set. You can use the File Select and Formatting utility (DFSER10) with exit DFSERA60 to format the trace entries.

### Related concepts

“Formatting IMS dumps offline” on page 560

Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

## Format of the Online Recovery Manager Trace

The Online Recovery Manager trace format, including record, module, explanation and trace subcode are shown.

### Trace Entry: Online Recovery Service Request

Table 42. Trace Entry: Online Recovery Service Request

| Record | Module                                            | Explanation                                         | Trace subcode |
|--------|---------------------------------------------------|-----------------------------------------------------|---------------|
| A001   | DFSRWM00 - Database Recovery Manager Master ITASK | Record cut when AWE request is received by DFSRWM00 | RWM00 Request |

### Trace record 3702 - create data set routine invoke DYA

The format of A001 is shown in the following table.

Table 43. Trace record 3702 - create data set routine invoke DYA

| Offset | Type      | Length | Description                  |
|--------|-----------|--------|------------------------------|
| 4      | Fixed     | 2      | Requested function(awrwfunc) |
| 6      | Bit       | 2      | RWGB_Flags                   |
|        | 1... ..   |        | rwgb_startup_complete        |
|        | .1.. ..   |        | rwgb_startup_failure         |
|        | ..1. .... |        | rwgb_dlisas                  |
|        | ...1 .... |        | rwgb_fp_allowed              |
|        | .... 1... |        | *                            |
|        | .... .1.. |        | rwgb_terminating             |
|        | .... .1.  |        | rwgb_record_pipe_alloc       |
|        | .... ...1 |        | rwgb_drm_init_complete       |
|        | 1... ..   |        | rwgb_ORS_installed           |
|        | .1.. .... |        | rwgb_DRF_installed           |
|        | ..11 1111 |        | *                            |
| 8      | Address   | 4      | Request AWE address          |
| 12     | Address   | 4      | Next AWE address             |
| 16     | Address   | 4      | awrwcecb                     |
| 20     | Fixed     | 4      | Awrwcecb->c_ecb              |

Table 43. Trace record 3702 - create data set routine invoke DYA (continued)

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 24     | Bit       | 4      | Rwgb_init_flags  |
|        | 1... ..   |        | rwgb_init_load_1 |
|        | .1.. ..   |        | rwgb_init_rwsp   |
|        | ..1. .... |        | rwgb_init_load_2 |
|        | ...1 .... |        | *                |
|        | .... 1... |        | rwgb_init_ascre  |
|        | .... .1.. |        | rwgb_init_route  |
|        | .... ..1. |        | rwgb_init_write  |
|        | .... ...1 |        | rwgb_init_read   |
|        | 1... ..   |        | rwgb_init_cmd    |
|        | .1.. ..   |        | rwgb_init_rtb    |
|        | ..1. .... |        | rwgb_init_fp     |
|        | ...1 .... |        | rwgb_init_dli    |
|        | .... 1111 |        | *                |
|        | 1111 1111 |        | *                |
|        | 1111 1111 |        | *                |

**Trace Entry: Online Recovery Service Request Processed**

Table 44. Trace Entry: Online Recovery Service Request Processed

| Record | Module                                            | Explanation                                                 | Trace subcode |
|--------|---------------------------------------------------|-------------------------------------------------------------|---------------|
| A002   | DFSRWM00 - Database Recovery Manager Master ITASK | Record is cut when DFSRWM00 completes processing of request | RWM00 Return  |

**Trace Entry: Online Recovery Service Request Processed**

The format of A002 is shown in the following table.

Table 45. Trace record 3702 - create data set routine invoke DYA

| Offset | Type      | Length | Description                  |
|--------|-----------|--------|------------------------------|
| 4      | Fixed     | 2      | Requested function(awrwfunc) |
| 6      | Bit       | 2      | RWGB_Flags                   |
|        | 1... ..   |        | rwgb_startup_complete        |
|        | .1.. ..   |        | rwgb_startup_failure         |
|        | ..1. .... |        | rwgb_dlisas                  |
|        | ...1 .... |        | rwgb_fp_allowed              |
|        | .... 1... |        | *                            |
|        | .... .1.. |        | rwgb_terminating             |
|        | .... ..1. |        | rwgb_record_pipe_alloc       |
|        | .... ...1 |        | rwgb_drm_init_complete       |
|        | 1... ..   |        | rwgb_ORS_installed           |
|        | .1.. ..   |        | rwgb_DRF_installed           |
|        | ..11 1111 |        | *                            |
| 8      | Fixed     | 4      | Request feedback (awrwfdbk)  |
| 12     | Address   | 4      | Rwgb_hold_queue              |
| 16     | Address   | 4      | Awrwcecb                     |

Table 45. Trace record 3702 - create data set routine invoke DYA (continued)

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 20     | Fixed     | 4      | Awrrwcecb->c_ecb |
| 24     | Bit       | 4      | Rwgb_init_flags  |
|        | 1... ..   |        | rwgb_init_load_1 |
|        | .1.. ..   |        | rwgb_init_rwsp   |
|        | ..1. .... |        | rwgb_init_load_2 |
|        | ...1 .... |        | *                |
|        | .... 1... |        | rwgb_init_ascre  |
|        | .... .1.. |        | rwgb_init_route  |
|        | .... ..1. |        | rwgb_init_write  |
|        | .... ...1 |        | rwgb_init_read   |
|        | 1... ..   |        | rwgb_init_cmd    |
|        | .1.. ..   |        | rwgb_init_rtb    |
|        | ..1. .... |        | rwgb_init_fp     |
|        | ...1 .... |        | rwgb_init_dli    |
|        | .... 1111 |        | *                |
|        | 1111 1111 |        | *                |
|        | 1111 1111 |        |                  |

**Trace Entry: Online Recovery Service Request Processor Termination**

Table 46. Trace Entry: Online Recovery Service Request Processor Termination

| Record | Module                                            | Explanation                                | Trace subcode |
|--------|---------------------------------------------------|--------------------------------------------|---------------|
| A003   | DFSRWM00 - Database Recovery Manager Master ITASK | Record is cut when DFSRWM00 is terminating | RWM00 Exit    |

**Trace record 3702 - create data set routine invoke DYA**

The format of A003 is shown in the following table.

Table 47. Trace record 3702 - create data set routine invoke DYA

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
| 4      | Fixed     | 2      | Requested function(awrrwfunc) |
| 6      | Bit       | 2      | RWGB_Flags                    |
|        | 1... ..   |        | rwgb_startup_complete         |
|        | .1.. ..   |        | rwgb_startup_failure          |
|        | ..1. .... |        | rwgb_dlisas                   |
|        | ...1 .... |        | rwgb_fp_allowed               |
|        | .... 1... |        | *                             |
|        | .... .1.. |        | rwgb_terminating              |
|        | .... ..1. |        | rwgb_record_pipe_alloc        |
|        | .... ...1 |        | rwgb_drm_init_complete        |
|        | 1... ..   |        | rwgb_ORS_installed            |
|        | .1.. ..   |        | rwgb_DRF_installed            |
|        | ..11 1111 |        | *                             |
| 8      | Fixed     | 4      | Request feedback (awrrwfbk)   |
| 12     | Address   | 4      | Rwgb_hold_queue               |

Table 47. Trace record 3702 - create data set routine invoke DYA (continued)

| Offset | Type       | Length | Description      |
|--------|------------|--------|------------------|
| 16     | Address    | 4      | Awrwcecb         |
| 20     | Fixed      | 4      | Awrwcecb->c_ecb  |
| 24     | Bit        | 4      | Rwgb_init_flags  |
|        | 1... ..    |        | rwgb_init_load_1 |
|        | .1.. ..    |        | rwgb_init_rwsp   |
|        | ...1. .... |        | rwgb_init_load_2 |
|        | ...1 ....  |        | *                |
|        | ... 1...   |        | rwgb_init_ascre  |
|        | .... 1..   |        | rwgb_init_route  |
|        | .... .1.   |        | rwgb_init_write  |
|        | .... ...1  |        | rwgb_init_read   |
|        | 1... ..    |        | rwgb_init_cmd    |
|        | .1.. ..    |        | rwgb_init_rtb    |
|        | ..1. ....  |        | rwgb_init_fp     |
|        | ...1 ....  |        | rwgb_init_dli    |
|        | .... 1111  |        | *                |
|        | 1111 1111  |        | *                |
|        | 1111 1111  |        | *                |

**Trace Entry: Online Recovery Pipe Receive Entry**

Table 48. Trace Entry: Online Recovery Pipe Receive Entry

| Record | Module                                                        | Explanation                            | Trace subcode |
|--------|---------------------------------------------------------------|----------------------------------------|---------------|
| A040   | DFSRWM00 - Database Recovery Manager Record Receive Processor | Record is cut when DFSRWM00 is entered | RWPRO Entry   |

The format of A040 is shown in the following table.

Table 49. Trace record 3702 - create data set routine invoke DYA

| Offset | Type      | Length | Description                  |
|--------|-----------|--------|------------------------------|
| 4      | Fixed     | 2      | Requested function(awrwfunc) |
| 6      | Bit       | 2      | RWGB_Flags                   |
|        | 1... ..   |        | rwgb_startup_complete        |
|        | .1.. ..   |        | rwgb_startup_failure         |
|        | ..1. .... |        | rwgb_dlisas                  |
|        | ...1 .... |        | rwgb_fp_allowed              |
|        | ... 1...  |        | *                            |
|        | .... 1..  |        | rwgb_terminating             |
|        | .... .1.  |        | rwgb_record_pipe_alloc       |
|        | .... ...1 |        | rwgb_drm_init_complete       |
|        | 1... ..   |        | rwgb_ORS_installed           |
|        | .1.. ..   |        | rwgb_DRF_installed           |
|        | ..11 1111 |        | *                            |



Table 49. Trace record 3702 - create data set routine invoke DYA (continued)

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
| 8      | Bit       | 4      | Rwgb_init_flags       |
|        | 1... ..   |        | rwgb_init_load_1      |
|        | .1.. ..   |        | rwgb_init_rwsp        |
|        | ..1. ..   |        | rwgb_init_load_2      |
|        | ...1 ..   |        | *                     |
|        | ... 1..   |        | rwgb_init_ascre       |
|        | .... 1..  |        | rwgb_init_route       |
|        | .... .1.  |        | rwgb_init_write       |
|        | .... ..1  |        | rwgb_init_read        |
|        | 1... ..   |        | rwgb_init_cmd         |
|        | .1.. ..   |        | rwgb_init_rtb         |
|        | ..1. ..   |        | rwgb_init_fp          |
|        | ...1 ..   |        | rwgb_init_dli         |
|        | .... 1111 |        | *                     |
|        | 1111 1111 |        | *                     |
|        | 1111 1111 |        | *                     |
| 12     | Bit       | 4      | Rwgb_read_flags       |
|        | 1... ..   |        | rwgb_read_terminating |
|        | .1.. ..   |        | rwgb_read_abend       |
|        | ..1. ..   |        | rwg_read_EODAD        |
|        | ...1 ..   |        | rwgb_read_open        |
|        | .... 1111 |        | *                     |
|        | 1111 1111 |        | *                     |
|        | 1111 1111 |        | *                     |
|        | 1111 1111 |        | *                     |
| 16     | Address   | 4      | Rwgb_read_pipe        |
| 20     | Address   | 4      | Rwgb_read_buffer      |

**Trace Entry: Online Recovery Pipe Received Record**

Table 50. Trace Entry: Online Recovery Pipe Received Record

| Record | Module                                                        | Explanation                                                       | Trace subcode |
|--------|---------------------------------------------------------------|-------------------------------------------------------------------|---------------|
| A041   | DFSRWM00 - Database Recovery Manager Record Receive Processor | Record is cut when DFSRWM00 receives record from recovery product | RWPRO Record  |

The format of A041 is shown in the following table.

Table 51. Trace record 3702 - create data set routine invoke DYA

| Offset | Type  | Length | Description                  |
|--------|-------|--------|------------------------------|
| 4      | Fixed | 2      | Requested function(awrwfunc) |

Table 51. Trace record 3702 - create data set routine invoke DYA (continued)

| Offset | Type      | Length | Description                    |
|--------|-----------|--------|--------------------------------|
| 6      | Bit       | 2      | RWGB_Flags                     |
|        | 1... ..   |        | rwgb_startup_complete          |
|        | .1.. ..   |        | rwgb_startup_failure           |
|        | .1. ....  |        | rwgb_dlisas                    |
|        | ...1 ...  |        | rwgb_fp_allowed                |
|        | ... 1...  |        | *                              |
|        | ... .1..  |        | rwgb_terminating               |
|        | ... .1.   |        | rwgb_record_pipe_alloc         |
|        | ... ..1   |        | rwgb_drm_init_complete         |
|        | 1... ..   |        | rwgb_ORF_installed             |
|        | .1.. ..   |        | rwgb_DRF_installed             |
|        | ..11 1111 |        | *                              |
| 8      | Bit       | 4      | Rwgb_init_flags                |
|        | 1... ..   |        | rwgb_init_load_1               |
|        | .1.. ..   |        | rwgb_init_rwsp                 |
|        | .1. ....  |        | rwgb_init_load_2               |
|        | ...1 ...  |        | *                              |
|        | ... 1...  |        | rwgb_init_ascre                |
|        | ... .1..  |        | rwgb_init_route                |
|        | ... .1.   |        | rwgb_init_write                |
|        | ... ..1   |        | rwgb_init_read                 |
|        | 1... ..   |        | rwgb_init_cmd                  |
|        | .1.. ..   |        | rwgb_init_rtb                  |
|        | .1. ....  |        | rwgb_init_fp                   |
|        | ...1 ...  |        | rwgb_init_dli                  |
|        | ... 1111  |        | *                              |
|        | 1111 1111 |        | *                              |
|        | 1111 1111 |        | *                              |
| 12     | Bit       | 4      | Rwgb_read_flags                |
|        | 1... ..   |        | rwgb_read_terminating          |
|        | .1.. ..   |        | rwgb_read_abend                |
|        | .1. ....  |        | rwg_read_EODAD                 |
|        | ...1 ...  |        | rwgb_read_open                 |
|        | ... 1111  |        | *                              |
|        | 1111 1111 |        | *                              |
|        | 1111 1111 |        | *                              |
|        | 1111 1111 |        | *                              |
| 16     | Address   | 4      | Address of record received     |
| 20     | Fixed     | 2      | Record type (logrc_type)       |
| 22     | Fixed     | 2      | Record subtype (logrc_subtype) |

### Online Recovery Manager trace example

An example of the Online Recovery Manager trace output is shown.

#### Online Recovery Manager trace example

```
OPTION PRINT 0=5,V=67FA,EXITR=DFSERA60
END
```

| FUNCTION                                                                                                            | WORD 0   | WORD 1   | WORD 2   | WORD 3   | WORD 4   | WORD 5   | WORD 6   | WORD     |
|---------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| 7                                                                                                                   |          |          |          |          |          |          |          |          |
| * OR1 TRACE TABLE - DATE 2004209 TIME 212317790537 OFFSET 028D SKIP 0000 TOTAL SKIP 00000000 RECORD NUMBER 000022B9 |          |          |          |          |          |          |          |          |
| RWM00 Request 09B18BAA                                                                                              | A0019700 | 00A63040 | 0B7143F8 | 00000000 | 00000000 | 040C0000 | 00000000 |          |
| RWPR0 Entry 09FB93AC                                                                                                | A040978A | 00A13040 | E7000000 | 00000000 | 00000000 | 00000000 | 40404040 |          |
| RWM00 Return 0A081EA6                                                                                               | A00297A8 | 00A6B040 | 00000000 | 0B7143F8 | 00000000 | 00000000 | EF000000 |          |
| RWPR0 Entry 0A082039                                                                                                | A04097AD | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWPR0 Record 0DD65C41                                                                                               | A04197AE | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWM00 Request 0DD65E3C                                                                                              | A00197B3 | 00A6B040 | 0B7143F8 | 0B7143B0 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0DD65E63                                                                                               | A00297B4 | 00A6B040 | 00000000 | 0B7143F8 | 00000000 | 00000000 | EF000000 |          |
| RWM00 Request 0DD65E6E                                                                                              | A00197B5 | 00B4B040 | 0B7143B0 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0DD65EDB                                                                                               | A00297B9 | 00B4B040 | 00000000 | 0B7143F8 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Request 0DD65EE7                                                                                              | A00197BA | 00A6B040 | 0B7143F8 | 0B714518 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0DD65F28                                                                                               | A00297BB | 00A6B040 | 00000000 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Request 0DD65F34                                                                                              | A00197BC | 00BEB040 | 0B714518 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0DD65F40                                                                                               | A00297BD | 00BEB040 | 00000000 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWPR0 Record 0EAF4E7B                                                                                               | A04197C5 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWPR0 Record 0EAF549C                                                                                               | A04197C9 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWPR0 Record 0EAF96C7                                                                                               | A0419843 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWPR0 Record 0EAF9AE2                                                                                               | A0419844 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWM00 Request 0EAF1AA                                                                                               | A0019849 | 00C4B040 | 0B7143B0 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0EAF1E2                                                                                                | A002984A | 00C4B040 | 00000000 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Request 0EAF1F0                                                                                               | A001984B | 00BEB040 | 0B7144D0 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 0EAF201                                                                                                | A002984C | 00BEB040 | 00000000 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Request 20A9CABE                                                                                              | A0019AE6 | 00A8B040 | 0B7144D0 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWM00 Return 20A9CDC0                                                                                               | A0029AEA | 00A8B040 | 00000000 | 00000000 | 00000000 | 040C0000 | EF000000 |          |
| RWPR0 Record 210B71FC                                                                                               | A0419B84 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 |          |
| RWPR0 Record                                                                                                        | A0419B88 | 00BDB040 | EF000000 | 00000000 | 0C666B78 | 0CC74FD8 | 40404040 | 210B7947 |

## Program isolation-related problem analysis

When invalid segment data is retrieved, or an unexpected user abend occurs during concurrent updates to a single database by more than one processing region under the protection of program isolation, improper enqueue or dequeue logic has been followed in IMS. Tools are available to properly document this occurrence. Correct and adequate documentation might depend on the ability to reproduce the error condition and on the availability of IBM Software Support.

## Limiting locking resources used by an application program

In order to avoid resource problems that can be caused by runaway applications, you can limit the number of locks an application can have by using the LOCKMAX parameter.

### LOCKMAX parameter

The LOCKMAX parameter can be specified on the PSBGEN statement or at execution time. The parameter has the following format: LOCKMAX=*n*, where *n* is a number between 0 and 255. 0 is the default and specifies no maximum lock limit.

### Using the LOCKMAX parameter

The number that is specified indicates units of 1000; for example, a specification of LOCKMAX=5 means that the application cannot have more than 5000 locks at one time.

Assemble the current DSECT describing the log record for the correct field offset because the offset for a field might change. For type X'37' log records, use the DFSXFER DSECT and select records that contain X'30' in the subtype field (such as type X'3778').

**Restriction:** Although the LOCKMAX parameter allows you to limit the amount of resources that are used by an application, it cannot be used to initially specify the amount of resources to be used by an application. Use traditional methods for specifying these resources through the PSB.

### Determining a value for the LOCKMAX parameter

To decide what value to use for the LOCKMAX parameter, analyze over a period of time the X'37', X'41', and X'5937' commit log records to determine the maximum number of locks being held per unit of work by the application.

Each of these log records contains a "high water lock count" or maximum lock count, which is the maximum number of locks held by the application. The X'41' log record shows a zero for the number of locks held, except in DL/I and DBB batch cases involved in block-level data sharing.

### Related reference

["Log records" on page 515](#)

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

### Exceeding the LOCKMAX parameter value

When an application exceeds the value specified for the LOCKMAX parameter, a pseudoabend of type U3301 results. Modules DFSLRHOO and DBFLRHOO set this pseudoabend when the return codes and feedback from either PI or IRLM indicate that the lock request failed because granting the lock would exceed the LOCKMAX parameter value.

## Program isolation trace

The program isolation (PI) trace traces all calls to the IMS enqueue/dequeue module (DFSFXC10) and writes the trace entries to the system log as type X'67FA' records.

Entries with IDs X'C7', X'C8', X'C9', X'CA', X'CB', and X'CC' are PI entries.

In a DB/DC environment, you start the trace by entering the /TRACE command at the master terminal operator's console. For batch or DB/DC environments, you specify LOCK=OUT on the OPTIONS statement at system initialization time.

Save the log tape and submit it as APAR documentation. If you cannot ship the log tape with the APAR, you can use the File Select and Formatting Print utility (DFSERA10) with exit DFSERA40 to select and format records related to the problem from the log tape.

You can find the layout of PI trace log record X'67FA' by assembling macro ILOGREC.

In analyzing the trace output, you see not only PI trace information but also lock manager trace information.

## Related concepts

[“DL/I trace formats” on page 163](#)

The figures in this section show the formats of the most commonly used DL/I trace entries. The figures are included to help you understand the DL/I trace entries in order to communicate more effectively with IBM Software Support representatives and to build a valid search argument.

## Related reference

[“Format of X'67' log record” on page 551](#)

A physical log record consists of one or more subrecords. Each subrecord is followed by its associated data.

## DL/I call image capture program

The DFSDLTR0 program, which operates independently, traces and records all DL/I calls issued by an application or multiple applications. The output is in a format acceptable as input to the DL/I test program DFSDDLTO.

This allows you to create the scenario that might have caused the problem. By inserting compare statements requesting SNAP documentation of DL/I control blocks before and after the suspected failure, the information collected helps in diagnosing the problem.

## Related tasks

[“DL/I call image capture” on page 155](#)

DL/I call image capture (module DFSDLTR0) enables you to trace and record all DL/I calls issued by an application program. The trace output is in a format acceptable as input to the DL/I test program DFSDDLTO.

## Log analysis (database related)

---

The IMS log is one of the most useful of all IMS service aids. Understanding log records and what information they contain can be very beneficial.

### Log record analysis

For all changes, write a copy of the segment before it is changed as well as a copy of the segment after it is changed, if applicable. This process not only facilitates backout and recovery, but it also is useful for diagnosis.

Analyzing log records is helpful whenever you suspect bad data or a pointer problem. Determine where the error is by referring to error messages or to the contents of the dump. When you identify the location of the problem, use the File Select and Formatting utility (DFSERA10) to print the log records for the block in error. Refer to the following table to interpret the contents of the log records. You can determine what changes to the data have been made, and in what sequence the changes were made. This information is helpful in identifying the source of the error.

Sometimes, the error is caused by an internal IMS problem; other times, the error results from incorrect data that is entered by a user or by an application.

To obtain a complete listing of all control blocks, DB, DC, and log records, assemble module DFSADSCT.

CICS puts a header on log records. To obtain the log records when running with CICS, the DD statement pointing to the CICS journal must specify DCB=RECFM=VB. This allows the File Select and Formatting utility to remove the header.

### Example of log analysis

An abend is issued against a database. You have used other diagnostic tools to analyze the call. Now you must look at the database. Follow these steps when looking at the database:

1. Analyze the buffer to identify what seems to be wrong. (See the following figure.) The first indication that something is wrong is usually found in the buffer.
2. Look at the changes to that buffer (block) on the log.

3. Determine if the bad data is actually on the database.
4. If required, determine if the image copy is propagating the bad block.

The following figure shows the general areas of database analysis: Application, Buffer, Database, Image Copy, and Log.

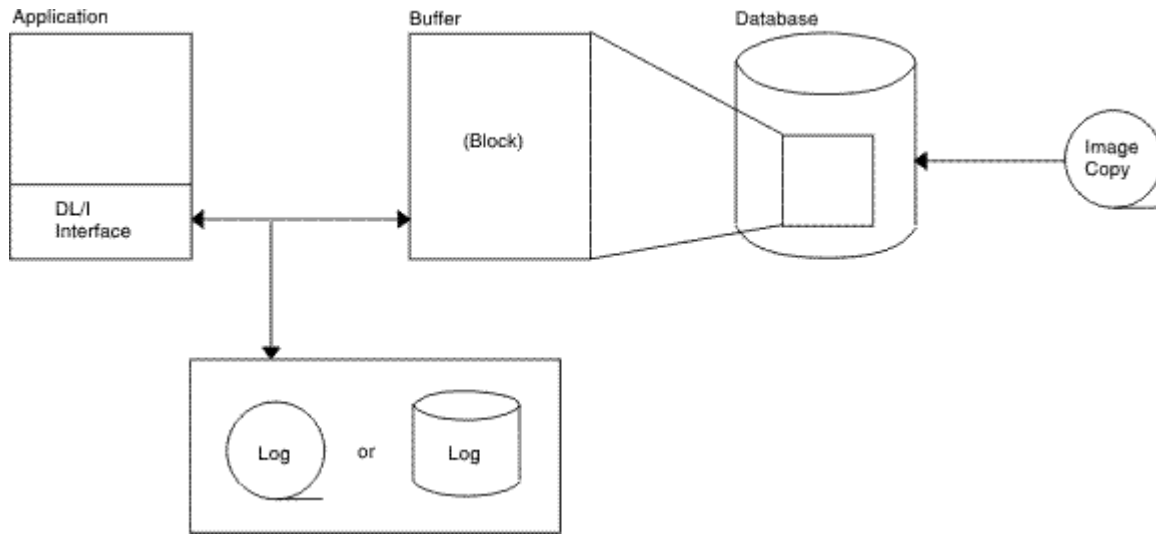


Figure 63. General areas of database (DB) analysis

### Database change log record DSECT

You can use the following table to assist you in the analysis of output from log record type X'50'.

If any differences are detected in the mapping of the DSECT, you can obtain a current copy by assembling the macro ILOGREC.

Table 52. Database change log record DSECT

| Offset       | Field    | Length | Description                                           |
|--------------|----------|--------|-------------------------------------------------------|
| <b>DLOGB</b> | DSECT    |        |                                                       |
| 00           | DLENGTH  | 2      | Length of log record                                  |
| 02           | DLOGZZ   | 2      | Zeros for QSAM                                        |
| 04           | DLOGCODE | 1      | Log record type                                       |
| 05           | DLOGSCDE | 1      | Log record subrecord (X'50' X'51' X'52')              |
| 06           | DLOGPSTN | 2      | PST number                                            |
| 08           | DLOGRTKN | 16     | Recovery token                                        |
| 18           | DLOGSTCK | 8      | CPU store clock (STCK)                                |
| 20           | DLOGVIMS | 1      | DLOG IMS Version/Release:<br>X'82' Version 8 or later |

Table 52. Database change log record DSECT (continued)

| Offset | Field    | Length | Description                                                                                                                                                                                                                                                                                                                                               |
|--------|----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 28     | DLOGDBF1 | 1      | <p>Flag 1</p> <p>X'80' Record written during backout</p> <p>X'40' Record from DB/DC</p> <p>X'20' Record from batch region</p> <p>X'10' New date/time from DFSFTIMO</p> <p>X'08' Commit each GU call (Mode=SNGL)</p> <p>X'04' First log record this sync interval</p> <p>X'02' First log record of a segment</p> <p>X'01' Last log record of a segment</p> |
| 29     | DLOGDBF2 | 1      | <p>Flag 2</p> <p>X'80' Database is nonrecoverable</p> <p>X'40' KSDS ERASE prohibited</p> <p>X'20' Bit map update for lock tracking</p> <p>X'10' Database is covered by RSR</p> <p>X'08' PHIDAM primary index; no REDO</p> <p>X'04' DLOGSEQ has update sequence number</p> <p>X'02' OLR non-backoutable; cursor not active yet</p> <p>X'01' OLR ITASK</p>  |
| 2A     | DLOGDBOR | 1      | <p>Database organization</p> <p>X'70' DEDB direct organization</p> <p>X'40' DL/I HDAM database</p> <p>X'20' DL/I HIDAM database</p> <p>X'10' Data entry database (DEDB)</p> <p>X'08' Primary or secondary index database</p> <p>X'04' HISAM or SHISAM database</p>                                                                                        |
| 2B     | DLOGDSOR | 1      | <p>Data set organization</p> <p>X'80' VSAM access method</p> <p>X'40' OSAM access method</p> <p>X'08' Entry sequenced data set</p> <p>X'04' Key sequenced data set</p>                                                                                                                                                                                    |
| 2C     | DPGMNAME | 8      | PSB name                                                                                                                                                                                                                                                                                                                                                  |
| 34     | DDBDNAME | 8      | Database name                                                                                                                                                                                                                                                                                                                                             |
| 3C     | DDSID    | 1      | <p>Data set ID (DCB number)</p> <p>X'80'</p> <ul style="list-style-type: none"> <li>• When this high order bit is on, then this DCB number represents one of the M-through-V or Y data sets.</li> <li>• When this high order bit is off, then this DCB number represents one of the A-through-J or X data sets.</li> </ul>                                |
| 3D     | DDSID2   | 1      | For ARID                                                                                                                                                                                                                                                                                                                                                  |
| 3E     | DLOGSLVL | 1      | Database share level (for DBRC-registered databases)                                                                                                                                                                                                                                                                                                      |

Table 52. Database change log record DSECT (continued)

| Offset                                        | Field    | Length | Description                                                                                                                          |
|-----------------------------------------------|----------|--------|--------------------------------------------------------------------------------------------------------------------------------------|
| 3F                                            | DLOGCALL | 1      | Describe DL/I call issued by application program X'80' ISRT call X'40' REPL call X'20' DLET call X'10' ROLL/ROLB/ROLS call (backout) |
| 40                                            | DLOGRBA  | 4      | OSAM RBN or VSAM RBA (LRECL)                                                                                                         |
| 44                                            | DLOGBLK0 | 2      | Offset of RBA within block                                                                                                           |
| 48                                            | DLOGSEQ  | 4      | Update the sequence number when X'04' flag is on in DLOGDBF2                                                                         |
| 4C                                            | DLOGXTOF | 2      | Database extension section offset (not used) <sup>“1” on page 220</sup>                                                              |
| 4E                                            | DLOGDSOF | 2      | Data sharing section offset <sup>“1” on page 220</sup>                                                                               |
| 50                                            | DLOGIDOF | 2      | RACF userid offset <sup>“1” on page 220</sup>                                                                                        |
| 52                                            | DLOGTKOF | 2      | Tracking (XRF) section offset <sup>“1” on page 220</sup>                                                                             |
| 54                                            | DLOGDLOF | 2      | DL/I call section offset (not used) <sup>“1” on page 220</sup>                                                                       |
| 56                                            | DLOGKYOF | 2      | Key data section offset <sup>“1” on page 220</sup>                                                                                   |
| 58                                            | DLOGSPOF | 2      | Space management section offset <sup>“1” on page 220</sup>                                                                           |
| 5A                                            | DLOGUNOF | 2      | UNDO data offset <sup>“1” on page 220</sup>                                                                                          |
| 5C                                            | DLOGREOF | 2      | REDO data offset <sup>“1” on page 220</sup>                                                                                          |
| 60                                            | DDATE    | 4      | Date in the format YYYYDDDF                                                                                                          |
| 64                                            | DTIME    | 6      | Time in the format HHMMSSTHMIJU                                                                                                      |
| 6A                                            | DZONE    | 2      | Offset to local time                                                                                                                 |
| <b>Data sharing section (DLOGDSHUR DSECT)</b> |          |        |                                                                                                                                      |
| 00                                            | DLOGDSSN | 4      | Data set sequence number (DSSN)                                                                                                      |
| 04                                            | DLOGLSN  | 6      | Lock sequence number (LSN)                                                                                                           |
| 0A                                            | DLOGUSID | 4      | Update Set ID (USID)                                                                                                                 |
| <b>RACF/SIGNON userid (DLOGID DSECT)</b>      |          |        |                                                                                                                                      |
| 00                                            | DLOGUSER | 8      | RACF userid                                                                                                                          |



Table 52. Database change log record DSECT (continued)

| Offset                                                                           | Field    | Length   | Description                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------|----------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Buffer and lock tracking for DL/I in XRF-capable systems (DLOGTRCK DSECT)</b> |          |          |                                                                                                                                                                                                                                                                                                                   |
| 00                                                                               | DLOGPOOL | 2        | Pool size for buffer tracking                                                                                                                                                                                                                                                                                     |
| 02                                                                               | DLOGBUFF | 2        | Buffer number for buffer tracking                                                                                                                                                                                                                                                                                 |
| 04                                                                               | DLOGHASH | 4        | Root hash value                                                                                                                                                                                                                                                                                                   |
| 08                                                                               | DLOGLOCK | 4        | Lock value                                                                                                                                                                                                                                                                                                        |
| 0C                                                                               | DLOGLFL1 | 1        | Change logger lock flag<br>X'80' Log record is for root segment<br>X'40' Log record is for dependent segment<br>X'20' Bypass reacquiring restart locks<br>X'10' Get bid lock on DDATAID<br>X'08' Function is erase<br>X'04' Index maintenance<br>X'02' Organization is SHISAM<br>X'01' Hash is for logical parent |
| 0D                                                                               | DLOGLFL2 | 1        | Reserved                                                                                                                                                                                                                                                                                                          |
| 0E                                                                               | DLOGDBDN | 8        | DBD name                                                                                                                                                                                                                                                                                                          |
| 16                                                                               | DLOGSKID | 4        | Task ID                                                                                                                                                                                                                                                                                                           |
| <b>KSDS key data section (DLOGKEY DSECT)</b>                                     |          |          |                                                                                                                                                                                                                                                                                                                   |
| 00                                                                               | DLOGKYF1 | 1        | X'40' KSDS key<br>X'20' Key is being erased                                                                                                                                                                                                                                                                       |
| 02                                                                               | DLOGKLEN | 2        | Length of key                                                                                                                                                                                                                                                                                                     |
| 04                                                                               | DLOGKDAT | variable | Key data                                                                                                                                                                                                                                                                                                          |
| <b>Space management section for HD inserts and deletes (DLOGSPCE DSECT)</b>      |          |          |                                                                                                                                                                                                                                                                                                                   |
| 00                                                                               | DLOGSPF1 | 1        | Space management flags<br>X'40' Demand space request<br>X'20' Get free space request (ISRT)<br>X'10' Free space request (DLET)                                                                                                                                                                                    |
| 02                                                                               | DLOGSOFF | 2        | Offset of space management request                                                                                                                                                                                                                                                                                |
| 04                                                                               | DLOGSLEN | 2        | Length of space management request                                                                                                                                                                                                                                                                                |
| <b>UNDO/REDO data section (DLOGDATA DSECT)</b>                                   |          |          |                                                                                                                                                                                                                                                                                                                   |

Table 52. Database change log record DSECT (continued)

| Offset | Field    | Length        | Description                                                                                                                                                                                          |
|--------|----------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00     | DLOGDFLG | 1             | X'80' Last data element in this section<br>X'40' Data is compressed using z/OS services                                                                                                              |
| 01     | DLOGDFUN | 1             | Describe physical function being logged by this request<br><br>X'80' Physical insert<br>X'40' Physical replace<br>X'20' Physical delete<br>X'10' Space management create<br>X'08' Free space element |
| 02     | DLOGDOFF | 2             | Offset of data in buffer                                                                                                                                                                             |
| 04     | DLOGDLEN | 2             | Length of data (DLOGDDAT)                                                                                                                                                                            |
| 06     | DLOGDDAT | variable      | Variable length data                                                                                                                                                                                 |
| 00     |          | 2<br>variable | Compressed data format in DLOGDDAT<br>Expanded data length<br>Compressed data                                                                                                                        |
|        | DBCKCHN  | 6             | Back chain <sup>“2”</sup> on page 220                                                                                                                                                                |
|        | DBLGSEG  | 8             | Logical logger sequence number <sup>“2”</sup> on page 220                                                                                                                                            |

**Notes:**

1. To find each section, add the offset to the beginning of the log record.
2. The log back chain and logical logger sequence number are at the end of the log record.

## Sequential buffering service aids

When you receive a message or abend that indicates a problem with sequential buffering (SB), several diagnostic tools are available. Some of these tools are useful for diagnosing other IMS database-related problems.

### Useful tools for diagnosing IMS data-related problems

- DL/I trace table entries
- Dump formatting of IMS control blocks
- SNAPS of IMS control blocks during pseudoabends

The //DFSSTAT statistics report is also a useful tool for evaluating a potential sequential buffering problem.

SB provides additional problem determination tools, which are described in this section:

- SBSNAP and SBESNAP options
- SB IMAGE CAPTURE option and the SB Test program (DFSSBHD0 utility)
- The SB COMPARE option

For most invocations of SB pseudoabend buffer handler functions, entries in the DL/I trace tables are provided. The SB trace table entries are:

**X'6F'**

Search/read by RBN

**X'6C'**

Refresh SB buffer after a write

**X'69'**

Invalidate SB buffers

**X'6A'**

Evaluate SB buffering

**X'6B'**

Describe why SB was or was not used for the application

In addition, the X'D1' DL/I trace table entry created by DFSNOTB0 contains some information about invalidation of SB buffers.

**Related concepts**

[“DL/I trace” on page 161](#)

The DL/I trace table is a combined trace consisting of entries from DL/I calls, the DL/I buffer handler, DL/I OPEN/CLOSE, HD space management, lock activity (using PI or IRLM), OSAM, DFP interface, HALDB OLR trace, and ABENDU0427.

[“SYS - System service aids” on page 515](#)

Various tools, utilities, and traces can help you analyze IMS system problems.

[“Dump formatting options” on page 598](#)

General formatting options are available for IMS and z/OS memory dumps.

[“SNAPs on exceptional conditions” on page 154](#)

IMS produces SNAPs of DL/I control blocks on the IMS log (or the CICS system log).

## **SBSNAP option**

The SBSNAP option generates a SNAP of the relevant control blocks and areas involved in the calls of the OSAM buffer handler to the SB buffer handler.

Use the SBSNAP option when you receive a message saying that either Sequential Buffering:

- Has been activated when you do not expect it to be
- Has not been activated when you expect it to be activated

IMS monitors the physical I/O being done by individual applications and then uses SB I/O reference pattern-analysis algorithms to select the most efficient method of data access. When you suspect a problem with these algorithms, the SBSNAP option provides diagnostic output you can analyze. The information that is provided in the SNAPs provides an indication of why SB chose between issuing a random read of one single block and a sequential read of multiple consecutive blocks.

As a result of analyzing SBSNAP output, you might realize you need to reorganize the database, redesign the database, or set different thresholds for the SB definition. The SBSNAP option is also useful when you are tuning your usage of SB after you've installed IMS or migrated to a new version.

To activate the SBSNAP option, provide a SBSNAP control statement in the //DFSCTL file. (See *IMS Version 14 System Definition* for detailed information.)

SNAPs are written to the IMS log as type X'67EE' records. You can format and print these records by using the File Select and Formatting Print utility (DFSERA10) with exit routine DFSERA30.

The SBSNAP option often creates a very large amount of SNAP output. You might therefore decide to limit the SNAP to a specific short period of the application execution. To limit the SBSNAP option to one period of the application execution, use the START and STOP keywords on the SBSNAP control statement. The syntax for these keywords is:

```
START=n STOP=
```

where *n* and *m* are the numbers of calls made to the SB buffer handler by the executing application.

To determine what values to use for *n* and *m*, look at the SPBSTCNB fields in the DL/I trace table and, if available, SNAP dumps (created by SBESNAP option). For each application, IMS maintains these call numbers in the SBPST, in the SBPSTCNB field. This field is periodically written to:

- The X'6A' DL/I trace table entry
- SNAPs that are created by the optional SBESNAP facility

Specifying START=*n* activates the SBSNAP option during the *n* the call to the SB buffer handler; specifying STOP=*m* deactivates the SBSNAP option during the *m*the call to the SB buffer handler.

## SBESNAP option

You activate the SBESNAP option by providing a SBESNAP control statement in the //DFSCTL file.

The SBESNAP option SNAPs the control blocks that are necessary for understanding the reason the SB evaluation logic did or did not recommend use of SB.

SNAPs are written to the IMS log as type X'67FD' records. You can format and print these records by using the File Select and Formatting Print utility (DFSERA10)with exit DFSERA30.

## Testing algorithms using the SB Test utility (DFSSBHD0)

When you run the SB IMAGE CAPTURE option of the DFSSBHD0 utility, the same sequential buffering (SB) handler call sequence (which is issued during the processing of a specific application) captures on the IMS log all internal IMS calls to the SB buffer handler You can use this utility to investigate and test behaviors of various algorithms.

The DFSSBHD0 utility with the SB IMAGE CAPTURE option is useful for investigating:

- The SB I/O reference pattern analysis algorithms
- The impact of changes to user-specifiable SB parameter values (the BUFSETS parameter value)

Running the same SB buffer handler call sequence multiple times is useful in the following situations:

- You need to use the SBSNAP option but do not know when to Start or Stop the SBSNAP option.
- You want to experiment with different SB algorithm parameters and observe the impact of these changes on the //DFSSTAT statistics.
- You want to test changes to the SB I/O reference pattern analysis algorithms and observe the impact of these changes on the //DFSSTAT statistics.

You activate the SB IMAGE CAPTURE option by providing a SBIC control statement in the //DFSCTL file.

## SB COMPARE option

You activate the SB COMPARE option when you suspect that the SB buffer handler returns incorrect block images into the buffers of the OSAM buffer handler. When you activate the SB COMPARE option, the SB buffer handler performs a self-check to see whether this suspicion is correct and provide problem determination information when the SB buffer handler really returns incorrect data.

When the SB COMPARE option is active, the SB buffer handler compares each block image that is returned to the OSAM buffer handler with the corresponding block image that is stored on DASD. When the comparison detects a mismatch between the two block images, the SB buffer handler invokes the SNAP-specific function, which produces a SNAP that describes the mismatch and contains:

- Relevant buffers and control blocks of DL/I
- The OSAM buffer handler
- The SB buffer handler

Module DFSSBSN0 then issues an abend (for batch) or a pseudoabend (for DB/DC, DBCTL, and CICS).

**Exception:** In a data-sharing environment, the SB buffer handler sometimes returns a back-level block image to the OSAM buffer handler. Therefore, in data sharing, the SB COMPARE option does not issue abends or pseudoabends.

You activate the SB COMPARE option by providing a SBCO control statement in the //DFSCTL file. Refer to *IMS Version 14 System Definition* for more information on the SBCO control statement in the //DFSCTL file.

SNAPs are written to the IMS log as type X'67EF' records. You can format and print these records by using the File Select and Formatting Print utility (DFSERA10) with exit DFSERA30.

## GSAM control block dump - DFSZD510

When a GSAM error occurs or when a DUMP or SNAP call is issued to a GSAM PCB, a formatted dump of the GSAM control blocks is written to the file that is defined as DDNAME IMSERR or SYSPRINT. You can use this GSAM control block dump (named DFSZD510) to diagnose GSAM problems.

### Example of when to use a GSAM control block dump

Some situations in which you would use a GSAM control block dump are when you receive a message identifying a GSAM error, or when you are having problems repositioning a GSAM data set when you are trying to restart an application that previously failed.

The following control blocks are included in the dump:

- GSAM pointer table (GPT)
- GSAM load table (GLT)
- GSAM data set control block (GB)
- GSAM queue control block (GQCB)
- GSAM buffer control block (GBCB)
- IMS program communication block (PCB)
- Data event control block (DECB)
- Request parameter list (RPL)

To produce a DSECT that shows the layout of the GSAM control blocks, assemble macro IGLI.

### Example of a formatted GSAM control block dump

In this example, key eye catchers are shown (in bold text) so that those sections of the dump are easier to find. Each problem is different, but diagnosing almost all GSAM problems involve at least these key areas of the dump.

```

          * * * GSAM CONTROL BLOCKS DUMP * * *
07A010 GSAM POINTER TABLE
          GPTNTRLR 800271D8  GPTERROR      00  GPTFC          GHU    GPTF1    0007A220  GPTF2    0004D50C
          GPTF3    00000000  GPTF4      00000000  GPTGB      0007A0C0  GPTGLT   0007A060  GPTHSEVC 08
          GPTMAIN  00001350  GPTMODE    00  GPTPCB     0007A090  GPTPMBLK 00009C90  GPTPSBL  00005540
          GPTRS1   00009C58  GPTSAVE    00079000  GPTSZS     0800  GPTSZW    0800  GPTTRACE 00009DF0
          GPTTYPE  00      GPTWORK    00079800

07A060 GSAM LOAD TABLE
          GLTSAM   8007B0C0  GLTBUFIO   00000000  GLTCBDMP   8007CCB0  GLTCNTRL 800271D8  GLTGPT    0007A010
          GLTOPENB 80032118  GLTOPENV   00000000  GLTVSAM    00000000

07A090 IMS PGM CONTROL BLK
          DBPCBDBD DBD37877  DBPCBFLG    02  DBPCBGB    0207A0C0  DBPCBLEV  0000  DBPCBMKL  0000000C
          DBPCBNSS 0000FFFF  DBPCBPRO    L  DBPCBSFD   DBPCBSTC  AM  DBPCBURL  00000000
          DBPCBRRR 00000000  00000000

07A0C0 GSAM BLOCK
          GBBFPORT  0000  GBBLKLEN    0000  GBBLKOH1    0001  GBBLKOH2   FFE0  GBBLKREF  00000401
          GBBLKSI   01C2  GBBQCB     00000000  GBBUFFER   00064CA0  GBBUFFSW   08  GBBUFNO   01
          GBDCISP   0000  GBCHAIN    0007A220  GBCRTNCD   0028  GBCSEVCD   08  GBCTRS    0000
          GBDCBPTR  B007A178  GBDDNAME   GS378770  GBDECB     0007A1D4  GBDEVYTP   208E  GBDSORG   81
          GBERRSW   00      GBEXLST    8607BEA2  GBGPTPTR   0007A010  GBGSAMSW   50  GBIOAREA  00093000
          GBLENLEN  0000  GBLRECL    0096  GBMAXTR     BB60  GBMINRCL   0000  GBNVOL    0001
          GBOPENSW  D1      GBPCBPTR   0007A090  GBPRTNCD   0000  GBRECFM    90  GBRECPTR  00064D36
          GBREQC    6201  GBREQP     0020  GBREQU     6201  GBRPLPTR   0007A1D4  GBRRAPTR  00091B88
          GBSERA    0000  GBSERR     0600  GBSUPVR    00      GBTRCALC   BB60  GBTRECL   0096
          GBURTNCD  AM      GBVLSQ     0001

07A178 DATA CONTROL BLOCK (DCB)
          DCBBFTEK  06      DCBBLKCT 04FDBEBC  DCBBLKSI    01C2  DCBBUFEB  01064C98  DCBBUFL   01C2
          DCBBUFNO  01      DCBBUFOF   00      DCBCHKCHK  00C894B0  DCBCIND1   00  DCBCIND2   00
          DCBCNTRL  00D57F48  DCBDDNAM   DCBDEBAD   009D1554  DCBDEN    AD  DCBDEVT   2E

```

|  |                 |          |          |          |                 |          |          |          |          |          |
|--|-----------------|----------|----------|----------|-----------------|----------|----------|----------|----------|----------|
|  | DCBDSORG        | 4000     | DCBDVTBA | FDBEBC   | DCBE0BR         | 01D57650 | DCBE0BW  | 00D57650 | DCBE0DA  | 07BEBA   |
|  | <b>DCBEODAD</b> | 0607BEBA | DCBEXLST | 9007A110 | DCBFDAD1        | 00000000 | DCBFDAD2 | 05000104 | DCBFUNC  | A0       |
|  | DCBIFLG         | C8       | DCBIFLGS | 00       | DCBIOBA         | 410050F0 | DCBIOBAD | 00005088 | DCBIOBL  | 09       |
|  | DCBKEYCN        | 00       | DCBKEYLE | 00       | <b>DCBLRECL</b> | 0096     | DCBMACR  | 97D8     | DCBMACRF | 2424     |
|  | DCBMODE         | 00       | DCBNCP   | 01       | DCBODEB         | 00005088 | DCBOFFSR | 30       | DCBOFFSW | 30       |
|  | DCBOFLGS        | 92       | DCBOPTCD | 00       | DCBPRTOV        | AD       | DCBPRTSP | 00       | DCBREAD  | 92C897D8 |
|  | DCBRCFM         | 90       | DCBREL   | 2EADA0   | DCBRELAD        | 00000000 | DCBRELB  | 002EADA0 | DCBSTACK | 00       |
|  | DCBSVCXL        | 00005088 | DCBSYNA  | 07BF68   | <b>DCBSYNAD</b> | 0907BF68 | DCBTIOT  | 007C     | DCBTRBAL | ADA0     |
|  | DCBTRTCH        | 00       | DCBWCP   | 01       | DCBWCP0         | 30       | DCBWRITE | 92C897D8 |          |          |

```

07A1D4 DECB
      7F000000 00200000 B007A178 00064CA0 000050F8 00000000
      064CA0 GB BUFFER
      064CA0 D7C1D9E3 D5E4D460 F0F0F0F0 F0F0F940 40404040 40404040 40404040 40404040
*PARTNUM.0000009
      064CC0 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064CE0 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064D00 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064D20 40404040 40404040 40404040 40404040 40404040 4040D7C1 D9E3D5E4 D460F0F0 *
PARTNUM.00*
      064D40 F0F0F0F1 F0404040 40404040 40404040 40404040 40404040 40404040 40404040
*00010
      064D60 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064D80 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064DA0 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064DC0 40404040 40404040 40404040 D7C1D9E3 D5E4D460 F0F0F0F0 F0F0F840 40404040 *
PARTNUM.0000008
      064DE0 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064E00 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064E20 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064E40 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      064E60 4040
*

```

```

* .....*
07A1F0 IMS PGM CONTROL BLK
      DBPCBDBD DBD3787X DBPCBFLG 02 DBPCBGB 0207A220 DBPCBLEV 0000 DBPCBMKL 0000000C
      DBPCBNSS 0000FFFF DBPCBPRO G DBPCBSFD DBPCBSTC DBPCBURL 00000000
      DBPCBRRA 00000000 00000000
07A220 GSAM BLOCK
      GBBFPORT 0000 GBBLKLEN 0000 GBLKOH1 0001 GBLKOH2 FFE0 GBLKREF 00000000
      GBLKSI 01C2 GBBQCB 00000000 GBBUFFER 00000000 GBBUFFSW 00 GBBUFNO 01
      GBCDISP 0000 GBCHAIN 0007A0C0 GBCRTNCD 0000 GBCSEVCD 00 GBCTRS 0000
      GBDCBPTR 8007A2D8 GBDDNAME GS378770 GBDECB 0007A334 GBDEVYTP 208E GBDSORG 81
      GBERRSW 00 GBEXLST 00000000 GBGPTPTR 0007A010 GBGSAMSW 00 GBIOAREA 00000000
      GBLENLEN 0000 GBLRECL 0096 GBMAXTR BB60 GBMINRCL 0000 GBNVOL 0001
      GBOPENSW C0 GBPCBPTR 0007A1F0 GBPRTNCD 0000 GBRECFM 90 GBRECPTR 00000000
      GBREQC 0020 GBREQ 0020 GBREQU 0020 GBRPLPTR 0007A334 GBRRAPTR 00000000
      GBSERA 0000 GBSERR C200 GBSUPVR 00 GBTRCALC BB60 GBTRECL 0000
      GBURTNCDC GBVLSQ 0000

```

```

07A2D8 DATA CONTROL BLOCK (DCB)
      DCBBFTEK 00 DCBBLKCT 00000000 DCBBLKSI 01C2 DCBBUFEB 00000000 DCBBUFL
01C2
      DCBBUFNO 00 DCBBUF0F 00 DCBCHECK 00000001 DCBCIND1 00
DCBCIND2
      DCBCNTRL 00000001 DCBDDNAM GS378770 DCBDEBAD F8F7F7D6 DCBDEN 00
DCBDEVT
      DCBDSORG 4000 DCBDVTBA 000000 DCBE0BR 01000001 DCBE0BW 00000001 DCBE0DA
000001
      DCBEODAD 00000001 DCBEXLST 90000000 DCBFDAD1 00000000 DCBFDAD2 00000000
DCBFUNC
      DCBIFLG 00 DCBIFLGS F8 DCBIOBA 00000001 DCBIOBAD 00000001
DCBIOBL
      DCBKEYCN 00 DCBKEYLE 00 DCBLRECL 0096 DCBMACR 2424 DCBMACRF
F3F7
      DCBMODE 00 DCBNCP 01 DCBODEB 00000001 DCBOFFSR 00
DCBOFFSW
      DCBOFLGS 02 DCBOPTCD 00 DCBPRTOV 00 DCBPRTSP 00 DCBREAD
02002424
      DCBRCFM 90 DCBREL 000000 DCBRELAD 00000000 DCBRELB 00000000
DCBSTACK
      DCBSVCXL 00000001 DCBSYNA 000001 DCBSYNAD 00000001 DCBTIOT C7E2 DCBTRBAL
0000
      DCBTRTCH 00 DCBWCP 00 DCBWCP0 00 DCBWRITE 02002424
07A334 DECB
      00000000 00800000 00000000 00000000 00000000 00000000
***END OF DUMP***

```

## Example of an unformatted GSAM control block dump

In this example, an unformatted GSAM control block dump is shown without key eye catchers.

```

0007A000 C7E2C1D4 40C2D3D6 C3D2E240 C8C5D9C5      800271D8 00000000 0007A060 00005540      *GSAM BLOCKS
HERE...Q.....*
0007A020 00009C90 00009DF0 0007A1F0 0007A220      D7E4D9C7 0007A0C0 00000000 00079800
*.....0...0....PURG.....*
0007A040 00079000 08000800 00001350 00009C58      0007A0C0 00005180 00000000 00000000
*.....*
0007A060 800271D8 0007A010 00000000 80032118      8007B0C0 00000000 00000000 00000000
*...Q.....*
0007A080 00000000 8007CCB0 00000000 00000000      C4C2C4F3 F7F8F7F7 00004040 D3404040
*.....DBD37877.. L *
0007A0A0 0207A0C0 40404040 40404040 0000000C      0000FFFF 00000000 00000000 00000000
*.....*
0007A0C0 0007A220 00000401 00010000 00010096      00000096 01C20000 0000208E 0001FFE0
*.....B.....*
0007A0E0 40400000 00289081 06000000 02830283      12020000 5008D101 00000000 00000000
*.....J.....*
0007A100 0007A010 0007A090 B007A178 0007A1D4      8607BEA2 00093000 00091B88 00000000
*.....M.....*
0007A120 00064CA0 00064D36 BB60BB60 00000000      C7E2F3F7 F8F7F7D6 00000000 00000000
*.....GS378770.....*
0007A140 00000000 00000000 00000000 00000000      00000000 00000000 00000000 00000000
*.....*
      LINE 0007A160 SAME AS ABOVE
0007A180 00050001 04FDBEBC 002EADA0 01064C98      01C24000 00005088 0607BEBA 9007A110
*.....B.....*
0007A1A0 007C2424 009D1554 92C897D8 00C894B0      0907BF68 000001C2 30013030 410050F0
*.....H.Q.H.....B.....0*
0007A1C0 01D57650 00D57650 00000096 00D57F48      00000000 7F000000 00200000 B007A178
*..N...N.....N.....*
0007A1E0 00064CA0 000050F8 00000000 00000000      C4C2C4F3 F7F8F7E7 00004040 C7404040
*.....8.....DBD3787X.. G *
0007A200 0207A220 40404040 40404040 0000000C      0000FFFF 00000000 00000000 00000000
*.....*
0007A220 0007A0C0 00000000 00000000 00010096      00000000 01C20000 0000208E 0001FFE0
*.....B.....*
0007A240 40400000 00009081 C2000000 02830283      00200000 0000C001 00000000 00000000
*.....B.....*
0007A260 0007A010 0007A1F0 8007A2D8 0007A334      00000000 00000000 00000000 00000000
*.....0...Q.....*
0007A280 00000000 00000000 BB60BB60 00000000      C7E2F3F7 F8F7F7D6 00000000 00000000
*.....GS378770.....*
0007A2A0 00000000 00000000 00000000 00000000      00000000 00000000 00000000 00000000
*.....*
      LINE 0007A2C0 SAME AS ABOVE
0007A2E0 00000000 00000000 00000000 00000000      01C24000 00000001 00000001 90000000
*.....B.....*
0007A300 C7E2F3F7 F8F7F7D6 02002424 00000001      00000001 000001C2 00000000 00000001
*GS378770.....B.....*
0007A320 01000001 00000001 00000096 00000001      00000000 00000000 00800000 00000000
*.....*
0007A340 00000000 00000000 00000000 00000000      00000000
*.....*
0007A700 84000000 18800000 000300CC FFFB26B4      00000000 00000000 00000000 00000000
*.....*
0007A720 0004D0A8 00080008 0004D0B0 00100010      0004D0B2 00020002 0004D0B4 0004D0B8
*.....*
0007A740 0004D0BC 0004D0C0 00080008 0004D0C8      00080008 00000000 40404040 40404040
*.....H.....*
0007A760 10004040 40404040 40404040 40404040      40404040 40404040 40404040 40404040
*...*
0007A780 00000000 00000000 00000000 00000000      00000000 00000000 00000000 00000000
*.....*
0007A7A0 00000000 00000000 00000000 00000000      00000000 00000000 0004D114 00009DF0
*.....J...0*
0007A7C0 009B6020 00000000 00000000 00093000      0004DD54 00000000 00000000 00029E50
*.....*
0007A7E0 00000000 00000000 00000000 00000000      C4C4D3E3 F0F1F340 D3D6C1C4 40404040
*.....DDL013 LOAD *
0007A800 00000000 00000000 00000000 00000000      00000000 00000000 00000000 00000000
*.....*
      LINES 0007A820-0007A860 SAME AS ABOVE
0007A880 00000000 00008500 0004D0A8 00000000      00000000 080073E8 00000000 00000000
*.....Y.....*
0007A8A0 00000000 00000000 00000000 00000000      00000000 00000000 00000000 00000000
*.....*
0007A8C0 00000000 080073E8 0004D050 00000000      00000000 00000000 00026B70 000641D8
*.....Y.....Q*

```

```

0007A8E0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00053040
*.....*
0007A900 00000000 00000000 000300CC 00000000 00000000 00000000 00000000 00000000
*.....*
0007A920 00000000 00000000 0004D94C 00000000 00000000 00000000 00000000 00000000
*.....R.....*
0007A940 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007A960 00000000 00000000 00000000 00000000 00009DA0 00000000 00010C00 0004D350
*.....L.....*
0007A980 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*

```

```

LINE 0007A9A0 SAME AS ABOVE
0007A9C0 84000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007A9E0 00000000 00000000 00000000 00000000 00000000 0088266F 11173205 02000000
*.....*
0007AA00 0004D050 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AA20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AA40 00060040 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AA60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AA80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 0002CEE6
*.....W.....*
0007AAA0 00000000 00000000 00000000 00000000 0005713F 00057040 00000000 07FC4040 40404040
*.....*
0007AAC0 00000000 00000000 00000000 00000000 00057340 00000000 00057140 00000000 00000000
*.....*
0007AAE0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINE 0007AB00 SAME AS ABOVE
0007AB20 00000000 00000000 0004DD64 00000000 00000000 00000000 0004DD90 00000000
*.....*
0007AB40 00000000 00000000 00000000 00000000 00000000 000C0000 00000000 00000000 00000000
*.....*
0007AB60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINE 0007AB80 SAME AS ABOVE
0007ABA0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 80049040
*.....*
0007ABC0 00009DA8 0004D554 4003AAE2 0002AF6C 00009DA0 00009DF0 00009C90 00009DF0
*.....N..S.....0*
0007ABE0 0008FD64 00009DF8 00093000 00000000 00093000 00090548 00000004 0004D050
*.....8.....*
0007AC00 0003A7A0 00000000 0004D50C 0004D59C FF02AFD2 0002BCEC 00009DA0 0004D050
*.....N..N..K.....*
0007AC20 00009C90 0004D50C 00009E38 00009D90 00093000 00000000 80093000 080073E8
*.....N.....Y*
0007AC40 00000004 0004D050 0002AF6C 00000000 0004D554 0004D5E4 FF02D5C6 00034100
*.....N..NU..NF....*
0007AC60 000073E8 0004D050 0002D9D0 00009DF0 0002CCD8 00029E50 080073E8 00005500
*.....Y.....R.....0..Q.....Y.....*
0007AC80 00093000 00000000 0004D0A8 0004D050 0002BCD8 00000000 0004D59C 0004D62C
*.....Q.....N..O..*
0007ACA0 FF034196 00034BD4 000073E8 0004D050 0002D9D0 00009DF0 0002CCD8 00029E50
*.....M..Y.....R.....0..Q.....*
0007ACC0 080073E8 00005500 00093000 0004D050 0004D0A8 080073E8 00034100 00000000
*.....Y.....Y.....*
0007ACE0 0004D5E4 0004D674 FF034E7A 0003C8B8 00000000 0004D050 0002D9D0 00009DF0
*.....NU..O.....H.....R.....0*
0007AD00 0002CCD8 00029E50 080073E8 00005500 00093000 0004D050 00000000 080073E8
*.....Q.....Y.....Y*
0007AD20 00034BD4 00000000 0004D62C 0004D6BC 00000000 00000000 00000000 00000000
*.....M.....O..O.....*
0007AD40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AD60 00000000 00000000 00000000 00000000 0004D674 0004D704 00000000 00000000
*.....O..P.....*
0007AD80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007ADA0 00000000 00000000 00000000 00000000 00000000 00000000 0004D6BC 0004D74C
*.....O..P..*
0007ADC0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINE 0007ADE0 SAME AS ABOVE
0007AE00 0004D704 0004D794 00000000 00000000 00000000 00000000 00000000
*..P..P.....*

```



```

0007AE20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AE40 00000000 00000000 0004D74C 0004D74C 00000000 00000000 00000000 00000000
*.....P..P.....*
0007AE60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AE80 00000000 00000000 00000000 00000000 0004D794 0004D824 00000000 00000000
*.....P..Q.....*
0007AEA0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AEC0 00000000 00000000 00000000 00000000 00000000 00000000 0004D7DC 0004D86C
*.....P..Q..*
0007AEE0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINE 0007AF00 SAME AS ABOVE
0007AF20 0004D824 0008BD98 00000000 00000000 00000000 00000000 00000000 00000000
*..Q.....*
0007AF40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AF60 00000000 00000000 0004D86C 0004D8FC 00000000 00000000 00000000 00000000
*.....Q..Q.....*
0007AF80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AFA0 00000000 00000000 00000000 00000000 0004D8B4 00000000 00000000 00000000
*.....Q.....*
0007AFC0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0007AFE0 00000000 00000000 00000000 00000000 00000002 00000000 D3C7E6C1 00518000
*.....LGWA.....*
00081560 47F0F034 2FC4C6E2 C6D3D3C7 F060F1F3 F060D3D6 C7C9C3C1
* .00..DFSLLG0.130.LOGICA*

```

## Recovering from Sx37 abends on GSAM data sets

When an application program is inserting records into a GSAM DASD data set and space on the data set is exceeded, an Sx37 abend occurs. The proper restart procedure depends on the physical characteristics of the GSAM data set and how IMS checkpointed the position in the data set.

### Recovering non-SMS-managed data sets

When an Sx37 abend occurs in a non-SMS-managed data set, you typically solve the problem by copying the data set and allocating more space for the copy.

You can copy the data set with the IEBGENER utility or another utility that reads and writes logical records. Do not do this for blocked GSAM BSAM DASD data sets if you plan to restart by using the copy. You must copy the physical records, not only the logical records. You can use the IEBGENER utility for this task, but you must specify different DCB parameters. A blocked data set has a record format of FB or VB.

To recover from an Sx37 abend on a blocked non-SMS-managed GSAM data set:

1. Copy the file to a larger data set by using the IEBGENER utility.
2. Specify RECFM=U for the record format for both the input and output data sets. This parameter copies the physical records as they exist. No reblocking is done. The copy must be to a like device type with the same track size. If the data set resides on multiple volumes, only the last volumes of data can be copied. GSAM keeps position by relative volume, by relative track within the volume, and by relative physical block within the track.
3. Change the RECFM parameter for the copied file to its original value: FB or VB. You can change the parameter by using any program that opens the data set, including the IEBGENER utility. Execute the IEBGENER utility with a SYSUT1 DD statement with DISP=SHR and a SYSUT2 DD statement with DISP=MOD. The SYSUT2 DD statement must specify RECFM=xx, where xx is the original GSAM data set record format value. This value causes the IEBGENER utility to open the data set for output. The IEBGENER utility does not copy any records to the data set, but it rewrites the DSCB with the updated RECFM value at close time.

You can now use the copy to restart the program from a checkpoint.

### Example JCL for copying a multivolume GSAM data set after an Sx37 abend

The following JCL describes how to copy a multivolume GSAM data set after an Sx37 abend occurs, which includes the following basic steps:

1. Uncatalog the data set that received the Sx37 abend.
2. Allocate a temporary data set for the last volume portion of the data set by using the original LRECL and BLOCKSIZE values, RECFM=U, and the new space allocation.
3. Copy the portion of the original data set from the last volume into the newly allocated temporary data set.
4. Delete the portion of the original data set that resides on the last volume.
5. Rename the temporary data set to the original name.
6. Catalog the data set again, using the new volume label if the data set has moved, and reset the RECFM keyword to its original value. The IEBGENER utility is recommended for this step because the data set has to be opened for the RECFM reset to take effect.
7. Submit the XRST job.

```
//B37C0PY JOB (IMS,xxxxxx),'GSAM TEST',
//      REGION=0M,
//      CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
//*****
//* 1. Uncatalog multivolume data set.
//*   The data set needs to be uncataloged before we can copy the
//*   the last volume of a multivolume data set
//*****
//UNCALG EXEC PGM=IEFBR14
//DD1      DD DSN=DBDC.IMS.GSAMTEST,DISP=(OLD,UNCATLG),UNIT=SYSDA
/*
//*****
//* 2. Allocate a new temporary data set with a bigger space allocation
//*   for the last volume portion of a multivolume data set.
//*****
//ALLOC EXEC PGM=IEFBR14
//SYSPRINT DD SYSOUT=A
//DD2      DD DSN=DBDC.IMS.GSAMTEMP,DISP=(NEW,KEEP),UNIT=SYSDA,
//          VOL=SER=SCR03,
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=80),
//          SPACE=(CYL,(5,1))
/*
//*****
//* 3. Copy current (smaller) GSAM/BSAM data set into a
//*   new (bigger) GSAM/BSAM data set by using DCB=(RECFM=U)
//*****
//COPY1 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSUT1  DD DSN=DBDC.IMS.GSAMTEST,DISP=(OLD),
//          UNIT=SYSDA,VOL=SER=SCR03,DCB=(RECFM=U)
//SYSUT2  DD DSN=DBDC.IMS.GSAMTEMP,DISP=OLD,
//          UNIT=SYSDA,VOL=SER=SCR03,DCB=(RECFM=U)
//SYSIN   DD DUMMY
/*
//*****
//* 4. Delete the smaller (original) of the data set that resides on
//*   the last volume
//*****
//BR14D EXEC PGM=IEFBR14
//SYSPRINT DD SYSOUT=A
//GSAMDS1 DD UNIT=SYSDA,DISP=(OLD,DELETE),VOL=SER=SCR03,
//          DSN=DBDC.IMS.GSAMTEST
/*
//*****
//* 5. Rename the new (copied to) data set to the original (copied
//*   from) data set name
//*****
//RENAME1 EXEC PGM=IEHPRGM
//SYSPRINT DD SYSOUT=A
//GSAMDS1 DD UNIT=SYSDA,DISP=OLD,VOL=SER=SCR03
//SYSIN DD *
//          RENAME DSNAME=DBDC.IMS.GSAMTEMP,VOL=DISK=SCR03,
//          NEWNAME=DBDC.IMS.GSAMTEST
/*
//*****
//* 6. Re-catalog the multivolume data set using the new volume for
//*   last volume of the data set, and change the RECFM
//*   from RECFM=U back to its original RECFM=.
//*   IEBGENER utility is recommended because the data set has to
//*   be opened for the RECFM reset to take effect
//*****
//*
```

```

//CATALG EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=DBDC.IMS.GSAMTEST,DISP=SHR,UNIT=SYSDA,
// VOL=SER=(222222,333333,000000,SCR03)
//SYSUT2 DD DSN=DBDC.IMS.GSAMTEST,DISP=(MOD,CATLG),UNIT=SYSDA,
// VOL=SER=(222222,333333,000000,SCR03),
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=80)
//SYSIN DD DUMMY
/*
//

```

## Recovering SMS-managed data sets

When the GSAM data set resides on SMS-managed volumes and is a non-striped data set, you can extend the existing data set if the maximum number of volumes (59) is not exceeded.

### Extending an SMS-managed, non-striped GSAM data set

When you convert GSAM data sets to SMS-managed data sets, consider converting to SMS-managed striped data sets, or at minimum, converting to striped data sets, before the maximum number of volumes (59) for a data set is reached.



**Attention:** If the installation must use non-striped data sets for GSAM databases, and a data set full condition forces you to add a new volume to the data set, be aware that the maximum number of volumes for a data set is 59 volumes. As you approach this limit, copy the data set by using a larger space allocation value before the data set volume limit is reached. If the volume limit is reached and an abend occurs, you will be unable to perform a GSAM XRST. The copy of the data set using the larger space allocation must be completed after a job that has ended normally. After the data set is copied, GSAM XRST cannot be done using checkpoints taken before the data set was copied.

To extend an SMS-managed, non-striped GSAM data set:

1. Under SMS, add extra volumes to the storage group, if necessary, and increase the number of volumes allowed for the DATACLAS keyword.
2. Using IDCAMS, enter the command `ALTER dsn ADVOL(*)` to indicate that additional volumes are available to the data set.

### Converting an SMS-managed, non-striped data set to a striped data set

Convert SMS-managed, non-striped data sets to SMS-managed, striped data sets before you execute jobs that might abend with Sx37 abends because they exceed the maximum number of volumes (59).

If an Sx37 abend occurs for an SMS-managed, non-striped data set due to the number of volumes for the data set exceeding 59 volumes, the data set cannot be recovered and an **XRST** cannot be completed.

The recovery cannot be completed because the SMS-managed, non-striped data set must be copied to an SMS-managed, striped data set with a larger primary and secondary allocation space parameter. When copying SMS-managed data sets, the copy process uses all the new space that is defined, starting with the first volume, which results in the checkpointed data record being moved not only to a different volume, but also having a different relative track and record (TTRZ, or TTTRZ for large format data sets). The copy process thus invalidates the restart position saved in the X'18' log record.

Migration from GSAM/BSAM non-striped data sets, which use TTRZ (or TTTRZ for large format data sets) for repositioning, to striped data sets, which use relative block number (RBN), results in an XRST failure or possibly an XRST reposition on the wrong data record. You cannot process a GSAM/BSAM non-striped data set, have an error condition occur, copy the data set to a striped data set, and then attempt to perform an **XRST** command. You must convert GSAM/BSAM non-striped data sets to striped data sets when you learn that your GSAM/BSAM databases are SMS-managed data sets and there is any chance that a job accessing that database might abend with an Sx37 number of volumes exceeded condition and that an **XRST** command is required.

To convert to an SMS-managed, non-striped data set to a striped data set:

1. Copy the non-striped data set to a new striped data set and use the same block size and device type.
2. Specify the RECFM=U record format for both the input and the output data set to avoid any reblocking.

3. When using DFSMS striped data sets, the restriction regarding maintaining the same number of records on the copied from and copied to volumes does not apply because with striped data sets, GSAM uses the RBN for NOTE/POINT, not the TTRZ (or TTTRZ for large format data sets).

In addition, GSAM supports DFSMS striped (extended format) data sets for both VSAM and BSAM.

**Related concepts**

[Processing GSAM databases \(Application Programming\)](#)

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## Chapter 9. DBRC - Database Recovery Control service aids

Diagnostic service aids, including RECON record types, DBRC internal trace, DBRC external trace are described.

### Diagnosing from a RECON list

---

You can use the **LIST** command to list the contents of all or part of the RECON data set.

You can list:

- The copy1 RECON data set
- RECON records for a particular change-accumulation group or for all change accumulation groups
- RECON records for a particular log data set or for all log data sets
- RECON records for a particular database data set or for DBDS groups
- Databases
- Subsystems
- Interim log records

Because some information is not printed when you issue the **LIST.RECON** command, you can issue the **PRINT** command for the access services method that you are using to list all information in hexadecimal format.

### RECON record types

---

The records in the RECON data set store information about logging activity and events that can affect the recovery of the database.

#### Content description of the keys in RECON records

To view the layout of the entire RECON record, see the following table. Consider these points as you examine the records:

- The RECON key size is 32 bytes.
- The last three bytes of the key contain either of the following values:
  - Reserved, and contain zeros.
  - First byte=0 and the last 2 bytes=key segment number.
- Time stamps have the following characteristics:
  - Time stamps are 12 bytes.
  - The symbolic UTC format is:  
YYYYDDDFHHMMSSTHMIJUAQQS  
An example of the UTC format is: 2004006F211432800000032D
  - DSPTIMES (DFSTIMES) contains time stamp structure information.

The following table shows the RECON record types.

Table 53. RECON record types

| Common name            | Part name | List ID | Release | Key fields                                                                                   |
|------------------------|-----------|---------|---------|----------------------------------------------------------------------------------------------|
| RECON Header           | DSPRCNRC  | RECON   | R-1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'01'<br>Time: hex zeros                           |
| RECON Header Extension | DSPRCR1   | *****   | R-3     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'01'<br>Time: X'00000000008'                      |
| Audit Trail Record     | DSPMUPHD  | *****   | 2.1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'02'<br>Time: sequence number                     |
| RECON DMB Table Record | DSPRDTRC  | *****   | 9.1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'03'<br>Time: hex zeros                           |
|                        |           |         |         | <b>Note:</b> Not listed in RECON Listing. An IDCAMS print will show the record if it exists. |
| PRILOG                 | DSPLOGRC  | PRILOG  | R-1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'05'<br>Time: time stamp                          |
| Interim PRILOG         | DSPLOGRC  | IPRI    | R-2     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'06'<br>Time: time stamp                          |
| LOGALL                 | DSPLGARC  | LOGALL  | R-1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'07'<br>Time: time stamp                          |
| SECLOG                 | DSPLOGRC  | SECLOG  | R-1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'09'<br>Time: time stamp                          |
| Interim SECLOG         | DSPLOGRC  | ISEC    | R-2     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'0A'<br>Time: time stamp                          |

Table 53. RECON record types (continued)

| Common name            | Part name | List ID  | Release | Key fields                                                                         |
|------------------------|-----------|----------|---------|------------------------------------------------------------------------------------|
| PRISLDS                | DSPLOGRC  | PRISLD   | R-3     | DBD: X'FFFFFFFF00000043'<br>DDN: subsystem name<br>Type: X'43'<br>Time: time stamp |
| PRITSLDS               | DSPLOGRC  | PRITSLDS | 5.0     | DBD: X'FFFFFFFF00000044'<br>DDN: subsystem name<br>Type: X'44'<br>Time: time stamp |
| Interim PRISLDS        | DSPLOGRC  | IPRISL   | R-3     | DBD: X'FFFFFFFF00000045'<br>DDN: subsystem name<br>Type: X'45'<br>Time: time stamp |
| Interim PRITSLDS       | DSPLOGRC  | IPRITSLD | 5.0     | DBD: X'FFFFFFFF00000046'<br>DDN: subsystem name<br>Type: X'46'<br>Time: time stamp |
| SECSLDS                | DSPLOGRC  | SECSLD   | R-3     | DBD: X'FFFFFFFF00000047'<br>DDN: subsystem name<br>Type: X'47'<br>Time: time stamp |
| SECTSLDS               | DSPLOGRC  | SECTSLDS | 5.0     | DBD: X'FFFFFFFF00000048'<br>DDN: subsystem name<br>Type: X'48'<br>Time: time stamp |
| Interim SECSLDS        | DSPLOGRC  | ISECSL   | R-3     | DBD: X'FFFFFFFF00000049'<br>DDN: subsystem name<br>Type: X'49'<br>Time: time stamp |
| Interim SECTSLDS       | DSPLOGRC  | ISECTSLD | 5.0     | DBD: X'FFFFFFFF00000050'<br>DDN: subsystem name<br>Type: X'50'<br>Time: time stamp |
| Change Accum Group     | DSPCAGRC  | CAGRP    | R-1     | DBD: hex zeros<br>DDN: CA group name<br>Type: X'0F'<br>Time: hex zeros             |
| Change Accum Execution | DSPCHGRC  | CA       | R-1     | DBD: hex zeros<br>DDN: CA group name<br>Type: X'11'<br>Time: time stamp            |

Table 53. RECON record types (continued)

| Common name       | Part name | List ID | Release | Key fields                                                                          |
|-------------------|-----------|---------|---------|-------------------------------------------------------------------------------------|
| DBDS Group        | DSPDGRC   | DBDSGRP | 2.1     | DBD: X'00000000000000007'<br>DDN: DBDS group name<br>Type: X'16'<br>Time: hex zeros |
| Database Header   | DSPDBHRC  | DB      | R-2     | DBD: DBD name<br>DDN: hex zeros<br>Type: X'18'<br>Time: hex zeros                   |
| Partition         | DSPPTNRC  | DB      | 7.1     | DBD: DBD name<br>DDN: Partition name<br>Type: X'19'<br>Time: hex zeros              |
| Database Data Set | DSPDSHRC  | DBDS    | R-1     | DBD: DBD name<br>DDN: DDN name<br>Type: X'20'<br>Time: hex zeros                    |
| Area Recovery     | DSPDSHRC  | DBDS    | R-3     | DBD: DBD name<br>DDN: area name<br>Type: X'20'<br>Time: hex zeros                   |
| Area Auth         | DSPDBHRC  | DBDS    | R-3     | DBD: DBD name<br>DDN: area name<br>Type: X'21'<br>Time: hex zeros                   |
| ALLOC             | DSPALLRC  | ALLOC   | R-1     | DBD: DBD name<br>DDN: DDN or area name<br>Type: X'28'<br>Time: time stamp           |
| Image Copy        | DSPIMGRC  | IMAGE   | R-1     | DBD: DBD name<br>DDN: DDN or area name<br>Type: X'2D'<br>Time: time stamp           |
| Reorg             | DSPRRGRC  | REORG   | R-2     | DBD: DBD name<br>DDN: DDN or area name<br>Type: X'32'<br>Time: time stamp           |
| Recovery          | DSPRCVRC  | RECOV   | R-1     | DBD: DBD name<br>DDN: DDN or area name<br>Type: X'37'<br>Time: time stamp           |



Table 53. RECON record types (continued)

| Common name            | Part name | List ID | Release | Key fields                                                                                       |
|------------------------|-----------|---------|---------|--------------------------------------------------------------------------------------------------|
| Backout                | DSPBKORC  | BACKOUT | 4.1     | DBD: X'FFFFFFFFF00000035'<br>DDN: subsystem name<br>Type: X'35'<br>Time: hex zeros               |
| Global Service Group   | DSPGSGRC  | GSG     | 5.0     | DBD: X'FFFFFFFFFFFFFFFF0000'<br>DDN: global service group name<br>Type: X'3A'<br>Time: hex zeros |
| Tracking Subsystem     | DSPSSRC   | SSYS    | 5.0     | DBD: X'FFFFFFFFF0000003E'<br>DDN: subsystem name<br>Type: X'3E'<br>Time: hex zeros               |
| Subsystem              | DSPSSRC   | SSYS    | R-2     | DBD: X'FFFFFFFFFFFFFFFFF'<br>DDN: subsystem name<br>Type: X'3F'<br>Time: hex zeros               |
| Available CA Execution | DSPCHGRC  | CA      | R-1     | DBD: hex zeros<br>DDN: hex zeros<br>Type: X'51'<br>Time: time stamp                              |
| PRIOLDS                | DSPOLDRC  | PRIOLD  | R-3     | DBD: X'FFFFFFFFF00000053'<br>DDN: subsystem name<br>Type: X'53'<br>Time: hex zeros               |
| Interim PRIOLDS        | DSPOLDRC  | IPRIOL  | R-3     | DBD: X'FFFFFFFFF00000055'<br>DDN: subsystem name<br>Type: X'55'<br>Time: hex zeros               |
| SECOLDS                | DSPOLDRC  | SECOLD  | R-3     | DBD: X'FFFFFFFFF00000057'<br>DDN: subsystem name<br>Type: X'57'<br>Time: hex zeros               |
| Interim SECOLDS        | DSPOLDRC  | ISECOL  | R-3     | DBD: X'FFFFFFFFF00000059'<br>DDN: subsystem name<br>Type: X'59'<br>Time: hex zeros               |
| Available Image Copy   | DSPIMGRC  | IMAGE   | R-1     | DBD: DBD name<br>DDN: DDN or area name<br>Type: X'6D'<br>Time: hex zeros                         |

## DBRC internal trace

DBRC internal trace is a useful tool for diagnosing problems that are possibly related to DBRC. The trace is always enabled.

### Types of problems DBRC internal trace can diagnose

The DBRC internal trace can help diagnose many different types of problems, such as:

- RECON data set contention
- RECON data set errors that are indicated by messages
- System abends in which the PSW is pointing to DBRC
- DBRC abends
- Whether DBRC or some other IMS component is causing the problem

Sometimes a problem occurs as a result of the interaction between two different modules performing different tasks. Interpreting trace entries is the best way to determine what each module was doing and when. For example, for RECON data set errors, it is important to know which DBRC modules manipulated the RECON data set and when.

You generally look at the DBRC trace output under the direction of an IBM Software Support representative, who will guide you in collecting data in specific trace fields and in interpreting that data. The DBRC trace entries that follow help you interpret trace data.

### Example of DBRC internal trace

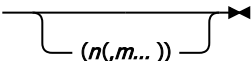
A user receives abend code xxx. The PSW is pointing to DBRC. The user reports the problem to an IBM support representative. Some of the steps that the user diagnostician might take under the guidance of the IBM representative are:

1. Locate the DBRC trace in the trace using the TRACETBL eye catcher.
2. Use the sample trace to verify that you have found the trace and to help you navigate through the trace table entries.
3. Find DBRC and IMS control blocks and data areas by using addresses from selected trace table entries.
4. Determine the events that occurred before the abend.
5. Use the information in the trace and data areas to understand what caused the abend.

Some DBRC functions have the capability of generating additional trace entries that can aid in problem analysis. An IBM representative can assist you in enabling one or more of these expanded trace options through the use of the **CHANGE . RECON** command.

The **CHANGE . RECON** command supports a TRACEOPT parameter that allows you, under the direction of an IBM representative, to select expanded DBRC trace options.

### CHANGE.RECON

➔ TRACEOPT 

**n,m,...**

DBRC TRACEOPT options

TRACEOPT is an optional parameter that you use only under the direction of an IBM Software Support representative for the purpose of gathering documentation for problem analysis. The IBM Software Support will provide the sub-options for the TRACEOPT parameter.

## DBRC trace input

When called, DSPTRACE receives a 16-byte parameter list.

### Contents of the parameter list

- An 8-character identifier that becomes the first 8 characters of the trace entry.
- A 4-byte control block pointer that points to a DFSBRLSB or the DSPRQB.
- A 4-byte block area pointer. 64 bytes of data from the block area are inserted in the trace entry. If the pointer is 0, the trace entry is 64 bytes long. Otherwise, the trace entry is 128 bytes long.

## Locating the DBRC trace

The DBRC trace is in the IMS-formatted portion of an IMS-formatted dump. There are four ways you can locate the DBRC trace.

### Method 1

Find the trace in the DBRC section of the IMS offline formatted dump.

### Method 2

Find any DSPxxxxx module in the Save Area trace of the dump. For most DSPxxxxx modules marked ENTERED VIA CALL, register 5 contains the address of the request level control block (RQB). Offset X'38' in the RQB contains the address of router storage. Offset X'1C' in router storage contains the address of the DBRC trace.

In certain situations, register 5 does not point to the RQB. If this is the case, use method 3 or method 4.

### Method 3

The trace is in subpool 0. If the dump has an index, look in the index to locate subpool 0. Scan this portion of the dump for eye catcher "TRACETBL," which identifies the beginning of the trace.

### Method 4

If you are looking at a dump online, search for eye catcher TRACETBL or GETFEED. If you search for the GETFEED eye catcher, you might first find it within DBRC modules. Search until you find the GETFEED eye catcher in the DBRC trace. Scroll to the beginning of the trace.

### Related reference

[“Unformatted DBRC internal trace example” on page 248](#)

The module-call entries, module return entries, DSPURIO0 trace entries, and other entries (such as GETFEED, DSPCRTR0, and CRTROXIT) are shown in this trace example.

## DBRC trace output

Trace output normally resides in subpool 0 storage, but you can direct output to a Generalized Trace Facility (GTF) data set.

The DBRC internal trace is a wraparound trace. That is, after the trace table is full, tracing starts at the beginning of the table, and each new entry overlays an old entry.

An entry with the identifier "TRACENXT" marks the next entry to be used, which is the logical end of the trace table.

### Related reference

[“DBRC external trace” on page 256](#)

If you start the Generalized Trace Facility (GTF) and issue the CHANGE.RECON TRACEON command, the DBRC trace (DSPTRACE) creates an external trace record and issues the GTRACE macro to invoke GTF.

## DBRC trace header record

The DBRC trace header record is shown.

```
words 0-1 - Identifier TRACETBL
word 2 - Length of the trace
word 3 - Count of trace calls made
word 4 - Beginning of trace table
word 5 - End of trace table
word 6 - Next entry to update
word 7 - Double word alignment
```

## Module call, module return, and DSPSTACK trace entries

With few exceptions, DBRC modules call module DSPSTGET to obtain initial work space and additional temporary work space (with the DSPGFSTK macro). Upon exit, DSPSTFRE releases the space obtained for the module. This centralized temporary storage management allows DBRC to track the flow of modules, starting with the first call out of DSPCRTR0 (entry point to DBRC).

Three trace entries accomplish this:

- Words 1 and 2 show the following items:
  - An arrow indicating whether the module is being called or is returning.
  - The nesting level of the module being called or returned to. Nesting levels are shown in one or two decimal digits, up to 99. (Nesting level 0 is DSPUIN00)
  - The last five characters of the module name being called or returning.
- DSPSTACK—additional work space trace entry (the result of the currently active module issuing the DSPGFSTK macro that calls DSPSTGET).

The following figure illustrates this processing flow:

1. Module A calls module B, which in turn calls DSPSTGET to obtain initial work space.
2. Module B issues macro DSPGFSTK to obtain additional work space.
3. Module B calls DSPSTFRE to release all temporary storage.
4. Module B returns control to module A.

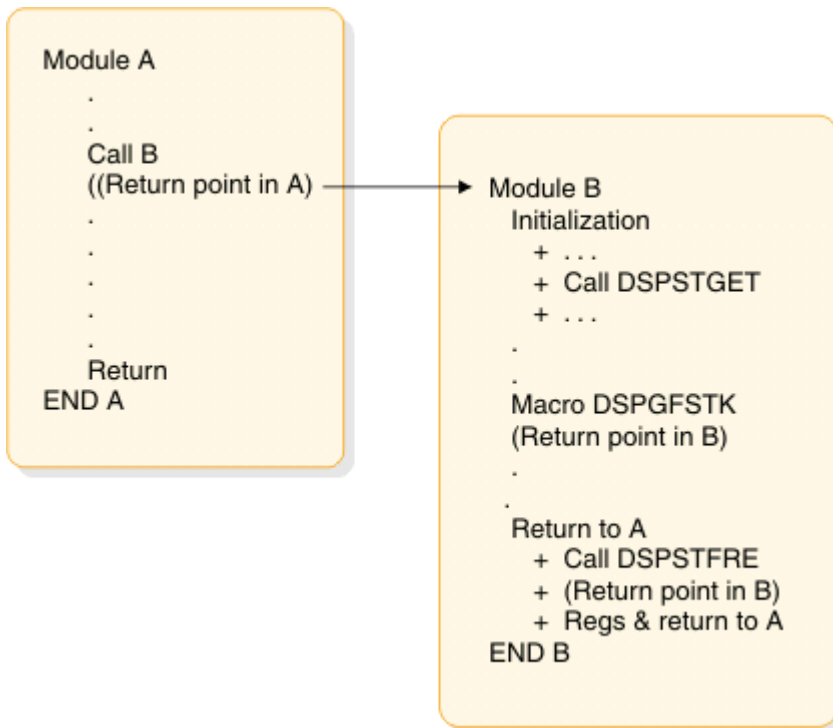


Figure 64. DBRC trace processing flow

“DBRC internal trace” on page 236 illustrates the format of the trace entries associated with this module flow. Each entry occupies one line (8 words) in the DBRC internal trace table. References to specific addresses and locations in modules A and B refer to the diagram above.

### One-line trace entry produced when module A calls module B

The following figure shows a one-line trace entry that is produced when module A calls module B. A one-line trace entry that is produced when module B calls DSPSTGET to obtain initial work space storage after being called by module A.

```

words 0-1 - Identifier which consists of:
- An arrow ("") indicating that the module is
  being called.
- The nesting level of module B. Nesting
  levels are shown in one or two decimal digits
  up to 99 (nesting level 0 is DSPUIN00).
- The last five characters of the module name
  being called.

word 2 - Address in module A of call to module B

word 3 - Entry point address of module B

word 4 - Save area address of the calling module (A)

word 5 - Beginning address of the temporary storage
  obtained for module B (B's save area address)

words 6-7 - Trace time stamp

```

### One-line trace entry produced when module B returns to module A

The following figure shows a one-line trace entry that is produced when module B calls DSPSTFRE to release all of its temporary storage before returning to module A.

```

words 0-1 - Identifier which consists of:
- The nesting level of module A. Nesting levels

```

are shown in one or two decimal digits up to  
- A left arrow (") indicating that the module is  
returning.  
99 (nesting level 0 is DSPUIN00).  
- The last five characters of the module name  
returning.

word 2 – Address in module A to which module B returns  
word 3 – Offset in module B where it returns to module A  
word 4 – Save area address of module A that called module B  
word 5 – Beginning address of the temporary storage being  
released for module B by module DSPSTFRE  
words 6-7 - Trace time stamp

### DSPSTACK trace entry

The following figure shows a one-line trace entry that is produced when module B issues macro DSPGFSTK, which calls DSPSTGET to obtain additional temporary storage.

words 0-1 – Identifier DSPSTACK  
word 2 – Return point address in the module B to which  
DSPSTGET returns after acquiring additional  
temporary storage for the module.  
word 3 – Entry point address of module B  
word 4 – Save area address of the module (B)  
word 5 – Beginning address of the additional temporary  
storage obtained for module B  
words 6-7 - Trace time stamp

### BGNCABN0, DSPCABN0, BGNRETRY, DSPCRTR0, and CRTROXIT trace entries

DBRC internal trace is a useful tool for diagnosing problems that are possibly related to DBRC. The trace is always enabled.

In DBRC, the following modules have specific trace calls inserted in their processing flow:

- DSPCABN0
- DSPCRTR0
- DSPURIO0

The following figures show the layout of the entries issued from BGNCABN0, DSPCABN0, and DSPCRTR0.

words 0-1 – Identifier BGNCABN0  
word 2 – A(DSPRQB)  
words 3-5 – Zeros  
words 6-7 - Time stamp

This is normally followed by either DSPCABN0 or a BGNRETRY entry.

The following figure shows that DBRC terminated because of an unrecoverable error.

words 0-1 – Identifier DSPCABN0  
word 2 – A(DSPRQB)  
words 3-5 – Zeros

```
words 6-7 - Time stamp
```

This is the last logical entry in the trace table.

The following figure shows that DBRC recovered from an abend condition and is beginning to execute a retry sequence of code.

```
words 0-1 - Identifier BGNRETRY
word 2 - A(DSPRQB)
words 3-5 - Zeros
words 6-7 - Time stamp
```

The following figure shows that the router made a trace call before passing control to the next DBRC routine that is scheduled to process the request identified by a DFSBRLSB.

```
Line 1:
  words 0-1 - Identifier DSPCRTR0
  word 2 - A(DFSBRLSB)
  words 3-5 - Data from DFSBRLSB: function flags, exit flags, address
              of DSPGDB (These fields are the same as the fields
              that are displayed in the DSPCRTR0 entry, but they
              might have been modified by the request.)
  words 6-7 - Time stamp
```

```
Line 2:
  word 0 - Address of BRLBPRNT field in DFSBRLSB
  words 2-7 - Data from DFSBRLSB (next 60 bytes after
              field BRLBPRNT)
```

```
Line 3:
  words 0-7 - Data from DFSBRLSB (continued from previous
              line)
```

The following figure shows the function requested in the DSPCRTR0 trace entry completed.

```
Line 1:
  words 0-1 - Identifier CRTR0XIT
  word 2 - A(DFSBRLSB)
  words 3-5 - Data from DFSBRLSB: function flags,
              exit flags, address of DSPGDB. (These
              are the same fields displayed in the
              DSPCRTR0 entry, but they might have been
              modified by the request.)
  words 6-7 - Time stamp
```

```
Line 2:
  words 0-4 - DFSBRLSB prefix
  words 5-7 - First 12 bytes of DFSBRLSB
```

```
Line 3:
  words 0-7 - DFSBRLSB (continued from previous line)
```

## DSPURI00 trace entries

A trace entry with the identifier DSPURI00 indicates the beginning of a series of trace calls that show what occurs as DSPURI00 processes an I/O request.

All trace calls from DSPURI00 result in 96-byte trace entries. There are nine separate calls to the trace routine in DSPURI00. The pointer to the DSPRQB follows the trace identifier. The following table shows the 8-character identifier and block-area pointer for each call.

Table 54. Calls to the trace routine in DSPURI00

| 8-character identifier | Block-area pointer | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DSPURI00               | MODIRCAR           | DSPURI00 receives control and the function-code value from DSPIRCAR indicates the type of call. (See <a href="#">“DSPURI00 entry trace entry”</a> on page 243.)                                                                                                                                                                                                                                                                                                     |
| OPENER1                | FILRESLT(I)        | DSPURI00 starts a physical open of a RECON data set.                                                                                                                                                                                                                                                                                                                                                                                                                |
| OPENER2                | FILRESLT(I)        | DSPURI00 completes a physical open of a RECON data set.                                                                                                                                                                                                                                                                                                                                                                                                             |
| OPENXA8                | FILRESLT(I)        | DSPURI00 encountered a VSAM OPEN failure with reason code X'A8'.                                                                                                                                                                                                                                                                                                                                                                                                    |
| GETFEED                | FILRESLT(I)        | After DSPURI00 issues an I/O request, the GETFEED procedure is called to trace specific information related to the I/O operation. Some of this information comes from DSPVFILE, some from the VSAM RPL, some from the record key and some from the I/O parameter block, DSPIOPAR. In addition, the RPL request is translated into a character printable code that describes the I/O operation. See <a href="#">“GETFEED trace entry for one RECON”</a> on page 244. |
| CLOSER1                | FILRESLT(I)        | DSPURI00 starts a true close of the RECON data set.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| CLOSER2                | FILRESLT(I)        | DSPURI00 completes a true close of the RECON data set.                                                                                                                                                                                                                                                                                                                                                                                                              |
| VSAMERR                | FILRESLT(I)        | A VSAM error occurred and the routine to print a VSAM error message was entered.                                                                                                                                                                                                                                                                                                                                                                                    |
| RDOPTERR               | RILRESLT(I)        | An invalid read integrity option was specified. An error message was issued.                                                                                                                                                                                                                                                                                                                                                                                        |
| DSPURI00               | ENDIRCAR           | DSPURI00 returns to its caller. Relevant exit condition information, if applicable, is traced. (See <a href="#">“DSPURI00 exit trace entry”</a> on page 246.)                                                                                                                                                                                                                                                                                                       |

The sequence of trace entries identified by DSPURI00, OPENER1, OPENER2, and GETFEED shows DSPURI00 receiving control and doing a physical open of one RECON data set. When DSPURI00 opens the second RECON data set, another sequence of OPENER1, OPENER2, and GETFEED entries follow the entries for the first RECON data set.

The DSPIRCAR data area includes a 1-byte function code and a 3-byte flag field. The function codes are alphabetic characters that identify what operation DSPURI00 does. The flag bytes further identify the type of operation. Pertinent information is extracted from the DSPIRCAR data area and placed in a modified IRCAR area, along with other processing information, to produce both the entry and exit traces within DSPURI00.

The GETFEED trace entry maps 64 bytes of information about the I/O operation. The last two lines of the entry contain this data.

The exit trace entry is similar to the entry trace. It is written upon return from DSPURI00, but only if one or more of the following conditions is true:



- This was a request to locate a specific RECON record.
- The request did not complete successfully (RC greater than 0 was returned).
- The copy 1 or 2 RECON status changed on this entry to DSPURI00.

### DSPURI00 entry trace entry

```
Line 1:
  words 0-1 - DSPURI00
  word 2 - RQB address
  words 3-5 - Binary zeros
  words 6-7 - Time stamp
```

```
Line 2:
  words 0-1 - MODIRCAR
  word 2 - c1c2
  word 3 - Func
  words 4-7 - 16-byte entry message
```

```
Line 3:
  words 0-5 - Key, blank, or repl ddname (key area)
  word 6 - addr
  word 7 - leng
```

#### time stamp

Trace time stamp.

#### c1c2

The DD statement number (1-3) of the copy 1 and copy 2 RECON, if any, on entry to DSPURI00.

#### func

Function and option bits received from caller in DSPIRCAR.

#### 16-byte entry message

EBCDIC message readable at the right end of the trace entry, such as LOGICAL OPEN, END MULT, UPDATE, and others. Class and sequential locate requests and configuration requests have a modifier at the end of their message:

#### F

Locate first

#### L

Locate last

#### NX

Locate next

#### P

Locate previous

#### NG

Locate not-greater-than

#### DSNS

Supply dsnames of RECONS in DSPIRCAR

#### STAT

Supply status of all RECONS in DSPIRCAR

#### DUAL

Enter dual mode

#### REPL

Replace RECON<sub>x</sub> with spare (where x = 1-3, see key area)

#### key area

For all locate, change, insert, and delete requests, contains the 32-byte key of the record involved. For replace requests, contains the ddname of the RECON to be replaced.

**addr**

Address of a record to be changed or inserted.

**leng**

Length of a record to be changed or inserted.

**GETFEED trace entry for one RECON**

## Line 1:

```
words 0-1 - GETFEED
word 2 - DSPRQBA
words 3-5 - Binary zeros
words 6-7 - Time stamp
```

## Line 2:

```
word 0 - RPLFDBWD
word 1 - FILLRECL
word 2 - FILNEWCA
word 3 - FILNEWEX
word 4 - FILCICNT
word 5 - FILCACNT
word 6 - FILEXCNT
word 7 - FILMAX
```

## Line 3:

```
word 0 - FILCISZ
word 1 - bytes 1-2 - FILFLAGS
           bytes 3-4 - FILOPERR
word 2 - FILBUFPT
word 3 - FILRCDPT
word 4 - FILRCDLN
word 5 - bytes 1-2 - SEGMENT NUMBER
           byte 3 - RECON NUMBER
           byte 4 - RPLREQ
word 6 bytes 1-4 and word 7 bytes 1-2 - PRINTABLE
   RPLREQ
word 7 - bytes 3-4 - NOT USED
```

**dsprqba**

Address of the DSPRQB.

**time stamp**

Trace time stamp.

**RPLFDBWD**

RPL feedback word.

**FILLRECL**

Logical record length.

**FILNEWCA**

Starting high-used relative byte address (RBA).

**FILNEWEX**

Starting high-allocated RBA.

**FILCICNT**

RECON changed counter value.

**FILCACNT**

Current high-used RBA.

**FILEXCNT**

Current high-allocated RBA.

**FILMAX**

VSAM maximum record size.

**FILCISZ**

Data control interval (CI) size.

**FILFLAGS**

RECON processing status flags (open, reserved, empty).

**FILOPERR**

Open SVC reason code if RC is not 0.

**FILBUFPT**

Pointer to header record buffer.

**FILRCDPT**

Pointer to the record in the VSAM I/O buffer or user area.

**FILRCDLN**

Length of record.

**SEGMENT NUMBER**

Record segment number.

**RECON COPY NUMBER**

Recon number used in this request.

**RPLREQ**

RPL request type.

**RPL REQUEST PRINTABLE CODE**

English word that is later translated into a printable code used to make a request to VSAM.

**RPL REQ PRINTABLE CODE**

This is translation of the RPLREQ field into a printable code that is close to being the English word for the request made to VSAM. The following table shows the translated RPLREQ printable codes.

*Table 55. Translated RPLREQ printable codes*

| <b>Printable code</b> | <b>Hexadecimal</b> | <b>RPLEQ</b>    | <b>RPL request</b>      |
|-----------------------|--------------------|-----------------|-------------------------|
| GET                   | 00                 | GET             | Retrieve a record       |
| PUT                   | 01                 | PUT             | Write a record          |
| CHECK                 | 02                 | CHECK           | Wait for completion     |
| POINT                 | 03                 | POINT           | Position for access     |
| ENDREQ                | 04                 | ENDREQ          | Terminate a request     |
| ERASE                 | 05                 | ERASE           | Delete a record         |
| VERIFY                | 06                 | VERIFY          | Synchronize end of data |
| *****                 | 07                 | Not used        | Not used                |
| DATPRE                | 08                 | DATA PREFORMAT  |                         |
| IDXPRES               | 09                 | INDEX PREFORMAT |                         |
| FORCIO                | 0A                 | Force I/O       |                         |
| GETIX                 | 0B                 | GET INDEX       |                         |
| PUTIX                 | 0C                 | PUT INDEX       |                         |
| SCHBFR                | 0D                 | SCHBFR          | Search Buffer           |
| MRKBFR                | 0E                 | MRKBFR          | Mark Buffer             |
| WRTBFR                | 0F                 | WRTBFR          | Write Buffer            |
| CNVTAD                | 10                 | CNVTAD          |                         |
| MNTACQ                | 11                 | MNTACQ          |                         |
| ACQRNG                | 12                 | ACQRANGE        |                         |
| TRMRPL                | 13                 | TERMRPL         |                         |

Table 55. Translated RPLREQ printable codes (continued)

| Printable code | Hexadecimal | RPLEQ          | RPL request |
|----------------|-------------|----------------|-------------|
| VERREF         | 14          | VERIFY REFRESH |             |

### DSPURI00 exit trace entry

Line 1:  
 words 0-1 – DSPURI00  
 word 2 – RQB address  
 words 3-5 – Binary zeros  
 words 6-7 – Time stamp

Line 2:  
 words 0-1 – ENDICAR  
 word 2 – c1c2  
 word 3 – Func  
 words 4-7 – 16-byte entry message

Line 3:  
 words 0-5 – Key, blank, or repl ddname (key area)  
 word 6 – addr  
 word 7 – lnc

#### time stamp

Trace time stamp.

#### c1c2

The DD statement number (1-3) of the copy 1 and copy 2 RECON, if any, on exit from DSPURI00.

#### func

Function and option bits received from caller in DSPIRCAR.

#### 16-byte exit message

For locate requests, contains either the message RECORD WAS FOUND or RECORD NOT FOUND, depending on the outcome of the search. Otherwise, contains a repeat of MODIRCAR contents.

#### key area

For a successful locate request, contains the 32-byte key of the RECON record returned to caller. Otherwise, contains a repeat of MODIRCAR contents.

#### addr

Address of the record found for a successful locate. Otherwise, 0.

#### lnc

Length of the record found for a successful locate, or the return code to be passed back to the module that called DSPURI00.

## Trace entries related to parallel RECON access

When parallel RECON access is enabled, trace entries that are related to parallel access processing are created. Trace calls are made when unexpected conditions occur during processing.

Layout of the DSPURI80 trace entry:

The trace entry is created when DBRC detects that VSAM has shunted data for a RECON data set.

Line 1:  
 words 0-1 – Identifier DSPURI80  
 word 2 – A(DSPRQB)  
 words 3-5 – Zeros  
 words 6-7 – Time stamp

Line 2:  
 word 0 – Index into FILE data for data set with shunted I/O data  
 words 1-2 – DDNAME of RECON data set with shunted I/O data  
 words 3-7 – Zeros

```
Line 3:
  words 0-7 - Zeros
```

Layout of the DSPRSYNC trace entry:

The trace entry is created when a non-zero return code is returned by an z/OS Resource Recovery Services ATRCMIT request or ATRBACK request.

```
Line 1:
  words 0-1 - Identifier DSPRSYNC
  word 2 - A (DSPRQB)
  words 3-5 - Zeros
  words 6-7 - Time stamp
```

```
Line 2:
  word 0 - Requested RRS request (1=commit, 2=backout)
  word 1 - Return code from ATRCMIT request or ATRBACK request
  words 2-7 - Zeros
```

```
Line 3:
  words 0-7 - Zeros
```

## DBRC group services entries

When DBRC is registered with SCI, module DSPRLX10 makes trace calls in response to group services requests. These calls can be requests to send notifications to other DBRC instances, event notifications, or requests or messages from other DBRC instances.

Requests without an accompanying message are traced in the DSPRLX10 trace entry. Entries with messages are traced in the DSPRLX1M trace entry.

Layout of the DSPRLX10 trace entry:

```
Line 1:
  words 0-1 - Identifier DSPRLX10
  word 2 - A(DFSBRLSB)
  words 3-5 - Data from DFSBRLSB: function flags, exit flags, address of DSPGDB.
              (These fields are the same as the fields that are
              displayed in the DSPCRTR0 entry, but they might have been modified by
              the request.)
  words 6-7 - Time stamp
```

Layout of the DSPRLX1M trace entry:

```
Line 1:
  words 0-1 - Identifier DSPRLX1M
  word 2 - A(DFSBRLSB)
  words 3-5 - Data from DFSBRLSB: function flags, exit flags, address of DSPGDB.
              (These fields are the same as the fields that are
              displayed in the DSPCRTR0 entry, but they might have been modified by
              the request.)
  words 6-7 - Time stamp
```

```
Line 2:
  words 0-1 - 'DSPRLMSG'
  word 3 - Message type
  word 4 - message subtype
  words 5-7 - Zeros
```

```
Line 3:
  words 0-3 - Message sender ID
  word 4 - Message sequence number
  word 5 - Message ID that is being responded to
  words 6-7 - First two words of message specific data
```

## Unformatted DBRC internal trace example

The module-call entries, module return entries, DSPURIO0 trace entries, and other entries (such as GETFEED, DSPCRTR0, and CRTR0XIT) are shown in this trace example.

```
*** DBRC TRACE TABLE ***
0B9A4700 E3D9C1C3 C5E3C2D3 00025900 00000DDA 0B9A4720 0B9C9F20 0B9C9B60 0B9C9FA0
*TRACETBL.....-.....*
0B9C9B60 E3D9C1C3 C5D5E7E3 40404040 40404040 40404040 40404040 40404040 40404040
*TRACENXT
0B9C9B80 40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040
*
      LINES 0B9C9BA0-0B9C9F1F SAME AS THE ABOVE
0B9A4720 606EF1E3 C9D4C5F0 8B99D3EC 0B939928 0B901E48 0B9A2010 BF9A6FDB F82B9987 *-
>1TIME0.rL..l.r.....?.8.rg*
0B9A4740 F04C60E3 C9D4C5F0 0B99D3EC 0000113A 0B901E48 0B9A2010 BF9A6FDB F82CA047 *0<-
TIME0.rL.....?.8...*
0B9A4760 606EF1E4 D9C9F0F0 8B99D5B4 0B94F9C8 0B901E48 0B9A2010 BF9A6FDB F82EF547 *-
>1URI00.rN..m9H.....?.8.5.*
0B9A4780 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FDB F82F0F47
*DSPURIO0.rU.....?.8...*
0B9A47A0 D4D6C4C9 D9C3C1D9 404001D8 D6000600 D7C8E8E2 C9C3C1D3 40D6D7C5 D5404040
*MODIRCAR .QO...PHYSICAL OPEN *
0B9A47C0 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*
      .....*
0B9A47E0 606EF2E4 D9C9F0F1 000007A4 0B954A98 0B9A2010 0B9A2780 BF9A6FDB F82F4047 *-
>2URI01..u.n.q.....?.8..*
0B9A4800 606EF3E4 C3D7F4F0 00000446 0B99A518 0B9A2780 0B9A2F50 BF9A6FDB F8301F07 *-
>3UCP40....r.v.....&..?.8...*
0B9A4820 F24C60E4 C3D7F4F0 0B954EDE 000001BE 0B9A2780 0B9A2F50 BF9A6FDB F8328D07 *2<-UCP40.n
+.....&..?.8...*
0B9A4840 606EF3D9 E3E7C4F0 00000556 0B929418 0B9A2780 0B9A2F50 BF9A6FDB F832A547 *-
>3RTXD0....km.....&..?.8.v.*
0B9A4860 F24C60D9 E3E7C4F0 0B954FEE 000002AE 0B9A2780 0B9A2F50 BF9A6FDB FF6A2270 *2<-
RTXD0.n|.j.....&..?.8...*
0B9A4880 606EF3E4 D9C9F1F0 00000AC0 0B95C958 0B9A2780 0B9A2F50 BF9A6FDB FF6C1030 *-
>3URI10....nI.....&..?.%..*
0B9A48A0 606EF4E4 D9C9F2F0 00000524 0B95FDA8 0B9A2F50 0B9A3628 BF9A6FDB FF6C4DB0 *-
>4URI20....n.y.....&.....?.%(*
0B9A48C0 606EF5E4 C1D3D3F0 000002F8 0B999BD0 0B9A3628 0B9A3A08 BF9A6FDB FF6CF070 *-
>5UALL0..8.r.....&.....?.%0.*
0B9A48E0 F44C60E4 C1D3D3F0 0B9600A0 000001DC 0B9A3628 0B9A3A08 BF9A6FDC 010B7535 *4<-
UALL0.o.....?.8...*
0B9A4900 606EF5E4 C1D3D3F0 000002F8 0B999BD0 0B9A3628 0B9A3A08 BF9A6FDC 010B98F5 *-
>5UALL0..8.r.....&.....?.q5*
0B9A4920 F44C60E4 C1D3D3F0 0B9600A0 000001DC 0B9A3628 0B9A3A08 BF9A6FDC 0281DA47 *4<-
UALL0.o.....?.a...*
0B9A4940 606EF5E4 C1D3D3F0 000002F8 0B999BD0 0B9A3628 0B9A3A08 BF9A6FDC 02820387 *-
>5UALL0..8.r.....&.....?.b.g*
0B9A4960 F44C60E4 C1D3D3F0 0B9600A0 000001DC 0B9A3628 0B9A3A08 BF9A6FDC 042CF50A *4<-
UALL0.o.....?.5...*
0B9A4980 F34C60E4 D9C9F2F0 0B95CE7C 000002C2 0B9A2F50 0B9A3628 BF9A6FDC 042D294A *3<-
URI20.n.@...B...&.....?.8...*
0B9A49A0 606EF4D9 D3C9F0F0 00000750 0B923570 0B9A2F50 0B9A3628 BF9A6FDC 042D7D4A *-
>4RLI00..&.k.....&.....?.'.*
0B9A49C0 606EF5D9 D3C1E4F0 0000035E 0B922FC0 0B9A3628 0B9A3C20 BF9A6FDC 042E038A *-
>5RLAU0...;.k.....&.....?.8...*
0B9A49E0 F44C60D9 D3C1E4F0 0B9238CE 0000047C 0B9A3628 0B9A3C20 BF9A6FDC 05C0B1B2 *4<-
RLAU0.k.....@.....&.....?.8...*
0B9A4A00 F34C60D9 D3C9F0F0 0B95D0A8 00000C8C 0B9A2F50 0B9A3628 BF9A6FDC 05C0D9F2 *3<-
RLI00.n.y.....&.....?.R2*
0B9A4A20 606EF4E4 D9C9F1F5 00000784 0B95F648 0B9A2F50 0B9A3628 BF9A6FDC 05C0F572 *-
>4URI15...d.n6...&.....?.5...*
0B9A4A40 F34C60E4 D9C9F1F5 0B95D0DC 0000030E 0B9A2F50 0B9A3628 BF9A6FDC 094FABB2 *3<-
URI15.n.....&.....?.|.8...*
0B9A4A60 606EF4D9 E2E5F0F0 00000796 0B998AE8 0B9A2F50 0B9A3628 BF9A6FDC 094FD6B2 *-
>4RSV00...o.r.Y...&.....?.|0.*
0B9A4A80 F34C60D9 E2E5F0F0 0B95D0EE 00000234 0B9A2F50 0B9A3628 BF9A6FDC 09523432 *3<-
RSV00.n.....&.....?.8...*
0B9A4AA0 606EF4E4 D9C9F1D7 000007F4 0B95AC48 0B9A2F50 0B9A3628 BF9A6FDC 09525272 *-
>4URI1P...4.n.....&.....?.8...*
0B9A4AC0 D6D7C5D5 C5D9F140 0B99E480 00000000 00000000 00000000 BF9A6FDC 09525BF2
*OPENER1.rU.....&.....?.8...$2*
0B9A4AE0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*
      .....*
      LINES 0B9A4B00-0B9A4B1F SAME AS THE ABOVE
0B9A4B20 C4E2D7E2 E3C1C3D2 8B95AE8E 0B95AC48 0B9A3628 0B9A3980 BF9A6FDC 09526932
*DSPSTACK.n...n.....&.....?.8...*
0B9A4B40 606EF5E4 D9C9F1D7 000008D0 0B95AC6E 0B9A3628 0B9A39D0 BF9A6FDC 174A3EF5 *-
>5URI1P...n.>.....&.....?.5...*
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0B9A4B60 C4E2D7E2 E3C1C3D2 8B95B7BC 0B95AC6E 0B9A39D0 0B9A3D28 BF9A6FDC 174A58B5
*DSPSTACK.n...n.>.....?.....*
0B9A4B80 F44C60E4 D9C9F1D7 0B95B518 00000CE0 0B9A3628 0B9A39D0 BF9A6FDC 1808143C *4<-
URI1P.n.....?.....*
0B9A4BA0 D6D7C5D5 C5D9F240 0B99E480 00000000 00000000 00000000 BF9A6FDC 1808233C
*OPENER2.rU.....?.....*
0B9A4BC0 00000000 00000000 00000000 00000000 00000000 00024000 00024000 00023000
*.....*
0B9A4BE0 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A4C00 F34C60E4 D9C9F1D7 0B95D14C 00000B30 0B9A2F50 0B9A3628 BF9A6FDC 1809373C *3<-
URI1P.nJ<.....&.....?.....*
0B9A4C20 606EF4E4 D9C9F1D7 000007F4 0B95AC48 0B9A2F50 0B9A3628 BF9A6FDC 180957FC *-
>4URI1P...4.n.....&.....?.....*
0B9A4C40 D6D7C5D5 C5D9F140 0B99E480 00000000 00000000 00000000 BF9A6FDC 1809603C
*OPENER1.rU.....?.....*
0B9A4C60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINES 0B9A4C80-0B9A4C9F SAME AS THE ABOVE
0B9A4CA0 C4E2D7E2 E3C1C3D2 8B95AEBE 0B95AC48 0B9A3628 0B9A3980 BF9A6FDC 1809667C
*DSPSTACK.n...n.....?.....@*
0B9A4CC0 606EF5E4 D9C9F1D7 000008D0 0B95AC6E 0B9A3628 0B9A39D0 BF9A6FDC 1E95B4FE *-
>5URI1P...n.>.....?.....n..*
0B9A4CE0 C4E2D7E2 E3C1C3D2 8B95B7BC 0B95AC6E 0B9A39D0 0B9A3D28 BF9A6FDC 1E95CDBE
*DSPSTACK.n...n.>.....?.....n..*
0B9A4D00 F44C60E4 D9C9F1D7 0B95B518 00000CE0 0B9A3628 0B9A39D0 BF9A6FDC 1F48747E *4<-
URI1P.n.....?.....=*
0B9A4D20 D6D7C5D5 C5D9F240 0B99E480 00000000 00000000 00000000 BF9A6FDC 1F487FBE
*OPENER2.rU.....?.....".....*
0B9A4D40 00000000 00000000 00000000 00000000 00000000 00024000 00024000 00023000
*.....*
0B9A4D60 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A4D80 F34C60E4 D9C9F1D7 0B95D14C 00000B30 0B9A2F50 0B9A3628 BF9A6FDC 1F4A063E *3<-
URI1P.nJ<.....&.....?.....*
0B9A4DA0 606EF4E4 D9C9F1D7 000007F4 0B95AC48 0B9A2F50 0B9A3628 BF9A6FDC 1F4A1E7E *-
>4URI1P...4.n.....&.....?.....=*
0B9A4DC0 D6D7C5D5 C5D9F140 0B99E480 00000000 00000000 00000000 BF9A6FDC 1F4A267E
*OPENER1.rU.....?.....=*

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0B9A4DE0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
LINES 0B9A4E00-0B9A4E1F SAME AS THE ABOVE
0B9A4E20 C4E2D7E2 E3C1C3D2 8B95AEBE 0B95AC48 0B9A3628 0B9A3980 BF9A6FDC 1F4A2EFE
*DSPSTACK.n...n.....?.....*
0B9A4E40 D6D7C5D5 C5D9F240 0B99E480 00000000 00000000 00000000 BF9A6FDC 2576658C
*OPENER2.rU.....?.....*
0B9A4E60 00000000 00000000 00000000 00000000 00000000 00024000 00023000
*.....*
0B9A4E80 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A4EA0 F34C60E4 D9C9F1D7 0B95D14C 00000B30 0B9A2F50 0B9A3628 BF9A6FDC 2577744C *3<-
URI1P.nJ<.....&.....?.....<*
0B9A4EC0 606EF4E4 D9C9F2F0 00000B6E 0B95FDCE 0B9A2F50 0B9A3628 BF9A6FDC 26B6A8B8 *-
>4URI20...>.n.....&.....?.....y..*
0B9A4EE0 606EF5E4 C1D3D3F0 000005A6 0B999BD0 0B9A3628 0B9A3A08 BF9A6FDC 2B69DCF8 *-
>5UALL0...w.i.....?.....8*
0B9A4F00 F44C60E4 C1D3D3F0 0B960374 000002AE 0B9A3628 0B9A3A08 BF9A6FDC 2B8387F8 *4<-
UALL0.o.....?.....cg8*
0B9A4F20 F34C60E4 D9C9F2F0 0B95D4C6 000005D4 0B9A2F50 0B9A3628 BF9A6FDC 2B8397B8 *3<-
URI20.nMF...M...&.....?.....cp.*
0B9A4F40 606EF4C4 C5D8F0F0 00000B8E 0B90DE68 0B9A2F50 0B9A3628 BF9A6FDC 2B83B078 *-
>4DEQ00.....&.....?.....c..*
0B9A4F60 F34C60C4 C5D8F0F0 0B95D4E6 000007DC 0B9A2F50 0B9A3628 BF9A6FDC 2B842AF8 *3<-
DEQ00.nMW.....&.....?.....d..8*
0B9A4F80 606EF4E4 D9C9F1D7 00001FE6 0B95AC48 0B9A2F50 0B9A3628 BF9A6FDC 30A7E3BA *-
>4URI1P...w.n.....&.....?.....xT.*
0B9A4FA0 D6D7C5D5 C5D9F140 0B99E480 00000000 00000000 00000000 BF9A6FDC 30A7FD3A
*OPENER1.rU.....?.....x..*
0B9A4FC0 00000000 00000000 00024000 00024000 00000000 00024000 00024000 00023000
*.....*
0B9A4FE0 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A5000 C4E2D7E2 E3C1C3D2 8B95AEBE 0B95AC48 0B9A3628 0B9A3980 BF9A6FDC 30A80DBA
*DSPSTACK.n...n.....?.....y..*
0B9A5020 606EF5E4 D9C9F1D7 000008D0 0B95AC6E 0B9A3628 0B9A39D0 BF9A6FDC 37330F38 *-
>5URI1P...n.>.....?.....*
0B9A5040 C4E2D7E2 E3C1C3D2 8B95B7BC 0B95AC6E 0B9A39D0 0B9A3D28 BF9A6FDC 373324B8
*DSPSTACK.n...n.>.....?.....*
0B9A5060 F44C60E4 D9C9F1D7 0B95B518 00000CE0 0B9A3628 0B9A39D0 BF9A6FDC 37EE8FB8 *4<-
URI1P.n.....?.....*

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0B9A5080 D6D7C5D5 C5D9F240 0B99E480 00000000 00000000 00000000 BF9A6FDC 37EE9BB8
*OPENER2 .rU.....?.....*
0B9A50A0 00000000 00000000 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A50C0 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A50E0 F34C60E4 D9C9F1D7 0B95E93E 00000B30 0B9A2F50 0B9A3628 BF9A6FDC 37EEA778 *3<-
URI1P.nZ.....&.....?....X.*
0B9A5100 606EF4E4 D9C9F1D7 00001FE6 0B95AC48 0B9A2F50 0B9A3628 BF9A6FDC 3C754CF5 *-
>4URI1P...w.n.....&.....?....<5*
0B9A5120 D6D7C5D5 C5D9F140 0B99E480 00000000 00000000 00000000 BF9A6FDC 3C7560B5
*OPENER1 .rU.....?.....*
0B9A5140 00000000 00000000 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A5160 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A5180 C4E2D7E2 E3C1C3D2 8B95AEBE 0B95AC48 0B9A3628 0B9A3980 BF9A6FDC 3C756AF5
*DSPSTACK.n...n.....?....5*
0B9A51A0 606EF5E4 D9C9F1D7 000008D0 0B95AC6E 0B9A3628 0B9A39D0 BF9A6FDC 42F77137 *-
>5URI1P...n.>.....&.....?....7.*
0B9A51C0 C4E2D7E2 E3C1C3D2 8B95B7BC 0B95AC6E 0B9A39D0 0B9A3D28 BF9A6FDC 42F78477
*DSPSTACK.n...n.>.....?....7d.*
0B9A51E0 F44C60E4 D9C9F1D7 0B95B518 00000CE0 0B9A3628 0B9A39D0 BF9A6FDC 43AB3B78 *4<-
URI1P.n.....?.....*
0B9A5200 D6D7C5D5 C5D9F240 0B99E480 00000000 00000000 00000000 BF9A6FDC 43AB4A78
*OPENER2 .rU.....?.....*
0B9A5220 00000000 00000000 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A5240 00002000 00000020 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A5260 F34C60E4 D9C9F1D7 0B95E93E 00000B30 0B9A2F50 0B9A3628 BF9A6FDC 43AB5678 *3<-
URI1P.nZ.....&.....?.....*
0B9A5280 606EF4E4 D9C9F3F0 00000D1E 0B961C46 0B9A2F50 0B9A3628 BF9A6FDC 43AB8B38 *-
>4URI30...o.....&.....?.....*
0B9A52A0 F34C60E4 D9C9F3F0 0B95D676 00000F0E 0B9A2F50 0B9A3628 BF9A6FDC 45367C7E *3<-
URI30.n0.....&.....?....@=*
0B9A52C0 F24C60E4 D9C9F1F0 0B955558 00000458 0B9A2780 0B9A2F50 BF9A6FDC 4536B13E *2<-
URI10.n.....&..?.....*
0B9A52E0 606EF3E4 D9C9F5F0 00002938 0B969170 0B9A2780 0B9A2F50 BF9A6FDC 4537053E *-
>3URI50...oj.....&..?.....*
0B9A5300 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A2F50 0B9A35A8 BF9A6FDC 45370F3E
*DSPSTACK.ol..oj.....&...y..?.....*
0B9A5320 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FDC 4537967E
*GETFEED .rU.....?....o=*
0B9A5340 00000000 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A5360 00002000 80500000 00000000 0B9012C4 00000280 00000100 C7C5E340 40400000
*.....&.....D.....GET...*
0B9A5380 F24C60E4 D9C9F5F0 0B9573D0 000002CE 0B9A2780 0B9A2F50 BF9A6FDC 45379EBE *2<-
URI50.n.....&..?.....*
0B9A53A0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FDC 4537B47E
*GETFEED .rU.....?....=*
0B9A53C0 00000000 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A53E0 00002000 80500000 00000000 0BB88000 00000280 00000100 C7C5E340 40400000
*.....&.....GET...*
0B9A5400 606EF3C4 C5D8F0F0 0000249A 0B90DE68 0B9A2780 0B9A2F50 BF9A6FDC 4539897E *-
>3DEQ00.....&..?....i=*
0B9A5420 F24C60C4 C5D8F0F0 0B956F32 000007DC 0B9A2780 0B9A2F50 BF9A6FDC 453AD3BE *2<-
DEQ00.n?.....&..?....L.*
0B9A5440 F14C60E4 D9C9F0F1 0B95016C 0000022E 0B9A2010 0B9A2780 BF9A6FDC 453B1E7E *1<-
URI01.n.%.....?....=*
0B9A5460 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FDC 453B377E
*DSPURI00.rU.....?....=*
0B9A5480 C5D5C4C9 D9C3C1D9 F1F201D8 D6000600 D7C8E8E2 C9C3C1D3 40D6D7C5 D5404040
*ENDIRCAR12.Q0...PHYSICAL OPEN *
0B9A54A0 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*.....*
0B9A54C0 F04C60E4 D9C9F0F0 0B99D5B4 00000B9E 0B901E48 0B9A2010 BF9A6FDC 453B42BE *0<-
URI00.rN.....?.....*
0B9A54E0 C4E2D7C3 D9E3D9F0 0A7EFCB4 17172002 00000000 0B99E480 BF9A6FF2 C2EBE40E
*DSPCRTR0.=.....rU...?2B.U.*
0B9A5500 00000000 00000000 00CB3D28 00000001 0B99E480 00000000 00000000 00000000
*.....rU.....*
0B9A5520 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0B9A5540 606EF1E2 E2C9C7D5 8000C4D4 0B936468 000067B8 0B9A2010 BF9A6FF2 C2EC458E *-
>1SSIGN..DM.l.....?2B...*
0B9A5560 606EF2E4 D9C9F0F0 00000258 0B94F9C8 0B9A2010 0B9A2220 BF9A6FF2 C2EC834E *-
>2URI00...m9H.....?2B.c+*
0B9A5580 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C2ECAFCF
*DSPURI00.rU.....?2B...*

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OB9A55A0 D4D6C4C9 D9C3C1D9 F1F201D8 D6000000 40D3D6C7 C9C3C1D3 40D6D7C5 D5404040 *MODIRCAR12.Q0...
LOGICAL OPEN *
OB9A55C0 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*
OB9A55E0 606EF3E4 D9C9F0F1 000007A4 0B954A98 0B9A2220 0B9A2990 BF9A6FF2 C2ED55CE *-
>3URI01...u.n.q.....?2B...*
OB9A5600 606EF4D9 E2E5F0F0 00000EC0 0B998AE8 0B9A2990 0B9A3160 BF9A6FF2 C2ED828E *-
>4RSV00...I.Y.....?2B.b.*
OB9A5620 F34C60D9 E2E5F0F0 0B955958 00000234 0B9A2990 0B9A3160 BF9A6FF2 C2F2958E *3<-
RSV00.n.....?2B2n.*
OB9A5640 606EF4E4 D9C9F3F0 00000F76 0B961C4C 0B9A2990 0B9A3160 BF9A6FF2 C2F2D40E *-
>4URI30...o.<.....?2B2M.*
OB9A5660 606EF5E4 D9C9F2F0 00001610 0B95FDDA 0B9A3160 0B9A3AF8 BF9A6FF2 C3FE36FC *-
>5URI20...n.....8...?2C...*

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OB9A5680 F44C60E4 D9C9F2F0 0B96325C 00000A10 0B9A3160 0B9A3AF8 BF9A6FF2 C3FE683C *4<-
URI20.o.*.....8...?2C...*
OB9A56A0 F34C60E4 D9C9F3F0 0B955A0E 00001648 0B9A2990 0B9A3160 BF9A6FF2 C3FE703C *3<-
URI30.n!.....?2C...*
OB9A56C0 606EF4E4 D9C9F5F0 00002938 0B969170 0B9A2990 0B9A3160 BF9A6FF2 C3FF047C *-
>4URI50...oj.....?2C...@*
OB9A56E0 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A3160 0B9A37B8 BF9A6FF2 C3FF11BC
*DSPSTACK.ol..oj.....?2C...*
OB9A5700 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C3FFBC3C
*GETFEED.ru.....?2C...*
OB9A5720 00000000 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
OB9A5740 00002000 80500000 0B9D4878 0B9012C4 00000280 00000100 C7C5E340 40400000
*.....&.....D.....GET...*
OB9A5760 F34C60E4 D9C9F5F0 0B9573D0 000002CE 0B9A2990 0B9A3160 BF9A6FF2 C3FFC6FC *3<-
URI50.n.....?2C.F.*
OB9A5780 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C3FFDBFC
*GETFEED.ru.....?2C...*
OB9A57A0 00000000 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
OB9A57C0 00002000 80500000 0B9D4878 0BB84000 00000280 00000100 C7C5E340 40400000
*.....&.....D.....GET...*
OB9A57E0 F24C60E4 D9C9F0F1 0B95016C 0000022E 0B9A2220 0B9A2990 BF9A6FF2 C400423C *2<-
URI01.n.%.....?2D...*
OB9A5800 F14C60E4 D9C9F0F0 0B9366C0 00000B9E 0B9A2010 0B9A2220 BF9A6FF2 C4005CBC *1<-
URI00.l.....?2D.*.*
OB9A5820 606EF2E4 D9C9F0F0 000003F8 0B94F9C8 0B9A2010 0B9A2220 BF9A6FF2 C40084BC *-
>2URI00...8.m9H.....?2D.d.*
OB9A5840 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C40093BC
*DSPURI00.ru.....?2D.l.*
OB9A5860 D4D6C4C9 D9C3C1D9 F1F201D8 D3002000 C4C9D9C5 C3E340D3 D6C3C1E3 C5404040
*MODIRCAR12.QL...DIRECT LOCATE *
OB9A5880 FFFFFFFF FFFFFFFF C9D4E2F1 40404040 3F000000 00000000 00000000 00000000
*.....IMS1.....*
OB9A58A0 606EF3E4 D9C9F5F0 000038E6 0B969170 0B9A2220 0B9A2990 BF9A6FF2 C400C9BC *-
>3URI50...w.oj.....?2D.I.*
OB9A58C0 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A2990 0B9A2FE8 BF9A6FF2 C400CFFC
*DSPSTACK.ol..oj.....Y...?2D...*
OB9A58E0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C40155BC
*GETFEED.ru.....?2D...*
OB9A5900 A9080010 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*z.....*
OB9A5920 00002000 80500000 0B9D4878 0B9012C4 00000280 00000100 C7C5E340 40400000
*.....&.....D.....GET...*
OB9A5940 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C401F87C
*GETFEED.ru.....?2D.8@*
OB9A5960 04080004 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
OB9A5980 00002000 80500000 0B9D4878 0B901828 00000280 00000103 D7D6C9D5 E3400000
*.....&.....POINT...*
OB9A59A0 F24C60E4 D9C9F5F0 0B9532AE 000002CE 0B9A2220 0B9A2990 BF9A6FF2 C401FD7C *2<-
URI50.n.....?2D...@*
OB9A59C0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4020DFC
*GETFEED.ru.....?2D...*
OB9A59E0 04080004 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
OB9A5A00 00002000 80500000 0B9D4878 0BB84000 00000280 00000103 D7D6C9D5 E3400000
*.....&.....POINT...*
OB9A5A20 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4021A7C
*DSPURI00.ru.....?2D..@*
OB9A5A40 C5D5C4C9 D9C3C1D9 F1F20004 D3002000 D9C5C3D6 D9C440D5 D6E340C6 D6E4D5C4
*ENDIRCAR12.L...RECORD NOT FOUND*
OB9A5A60 FFFFFFFF FFFFFFFF C9D4E2F1 40404040 3F000000 00000000 00000000 00000000
*.....IMS1.....*
OB9A5A80 F14C60E4 D9C9F0F0 0B936860 00000B9E 0B9A2010 0B9A2220 BF9A6FF2 C4021E7C *1<-
URI00.l.....?2D...@*

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0B9A5AA0 606EF2E4 D9E3F0F0 00000512 0B971360 0B9A2010 0B9A2220 BF9A6FF2 C40237BC *-
>2URT00...p.-.....?2D...*
0B9A5AC0 606EF3C3 C8D2E6C4 00000278 0B90A010 0B9A2220 0B9A2858 BF9A6FF2 C40248BC *-
>3CHKWD.....?2D...*
0B9A5AE0 F24C60C3 C8D2E6C4 0B9715D8 0000017C 0B9A2220 0B9A2858 BF9A6FF2 C4025FBC *2<-
CHKWD.p.Q...@.....?2D.^.*
0B9A5B00 606EF3E4 D9C9F0F0 0000037A 0B94F9C8 0B9A2220 0B9A2858 BF9A6FF2 C4026F3C *-
>3URI00...:m9H.....?2D.?.*
0B9A5B20 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C402753C
*DSPURI00.rU.....?2D...*
0B9A5B40 D4D6C4C9 D9C3C1D9 F1F201D8 D6002000 40D3D6C7 C9C3C1D3 40D6D7C5 D5404040 *MODIRCAR12.Q0...
LOGICAL OPEN *
0B9A5B60 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*
0B9A5B80 606EF4E4 D9C9F0F1 000007A4 0B954A98 0B9A2858 0B9A2FC8 BF9A6FF2 C40291BC *-
>4URI01...u.n.q.....H..?2D.j.*
0B9A5BA0 F34C60E4 D9C9F0F1 0B95016C 0000022E 0B9A2858 0B9A2FC8 BF9A6FF2 C402A07C *3<-
URI01.n.%.....H..?2D.@*
0B9A5BC0 F24C60E4 D9C9F0F0 0B9716DA 00000B9E 0B9A2220 0B9A2858 BF9A6FF2 C402A63C *2<-
URI00.p.....?2D.w.*
0B9A5BE0 606EF3E4 D9E3F7F0 000030C0 0B97F450 0B9A2220 0B9A2858 BF9A6FF2 C402C4BC *-
>3URT70...p4&.....?2D.D.*
0B9A5C00 606EF4E4 D9C9F0F0 0000023E 0B94F9C8 0B9A2858 0B9A2948 BF9A6FF2 C402D7BC *-
>4URI00...:m9H.....?2D.P.*
0B9A5C20 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C402E07C
*DSPURI00.rU.....?2D.@*
0B9A5C40 D4D6C4C9 D9C3C1D9 F1F201D8 C2002000 C2C5C740 D4E4D3E3 40E4D7C4 C1E3C540
*MODIRCAR12.QB...BEG MULT UPDATE *
0B9A5C60 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*
0B9A5C80 606EF5E4 D9C9F4F0 00000968 0B966886 0B9A2948 0B9A30B8 BF9A6FF2 C402FD7C *-
>5URI40...o.f.....?2D.@*
0B9A5CA0 606EF6E4 D9C9F3F0 00000236 0B961C46 0B9A30B8 0B9A34C0 BF9A6FF2 C4030EFC *-
>6URI30...o.....?2D...*
0B9A5CC0 F54C60E4 D9C9F3F0 0B966ABC 00000F0E 0B9A30B8 0B9A34C0 BF9A6FF2 C483E738 *5<-
URI30.o.....?2DcX.*
0B9A5CE0 F44C60E4 D9C9F4F0 0B950330 00000256 0B9A2948 0B9A30B8 BF9A6FF2 C483FA78 *4<-
URI40.n.....?2Dc..*
0B9A5D00 F34C60E4 D9C9F0F0 0B97F68E 00000B9E 0B9A2858 0B9A2948 BF9A6FF2 C48408F8 *3<-
URI00.p6.....?2Dd.8*
0B9A5D20 606EF4E4 D9C9F0F0 000002B8 0B94F9C8 0B9A2858 0B9A2948 BF9A6FF2 C4842138 *-
>4URI00...:m9H.....?2Dd..*
0B9A5D40 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4842A38
*DSPURI00.rU.....?2Dd..*
0B9A5D60 D4D6C4C9 D9C3C1D9 F1F201D8 D3002000 C4C9D9C5 C3E340D3 D6C3C1E3 C5404040
*MODIRCAR12.QL...DIRECT LOCATE *
0B9A5D80 FFFFFFFF FFFFFFFF C9D4E2F1 40404040 3F000000 00000000 00000000 00000000
*.....IMS1.....*
0B9A5DA0 606EF5E4 D9C9F5F0 000038E6 0B969170 0B9A2948 0B9A30B8 BF9A6FF2 C4846A78 *-
>5URI50...w.o.j.....?2Dd..*
0B9A5DC0 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A30B8 0B9A3710 BF9A6FF2 C48471B8
*DSPSTACK.ol.oj.....?2Dd..*
0B9A5DE0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C484FB78
*GETFEED.rU.....?2Dd..*
0B9A5E00 A9080010 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*Z.....*
0B9A5E20 00002000 80500000 0B9D4878 0B9012C4 00000280 00000100 C7C5E340 40400000
*.....&.....D.....GET.....*
0B9A5E40 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4856138
*GETFEED.rU.....?2De/. *
0B9A5E60 04080004 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A5E80 00002000 80500000 0B9D4878 0B901828 00000280 00000103 D7D6C9D5 E3400000
*.....&.....POINT.....*
0B9A5EA0 F44C60E4 D9C9F5F0 0B9532AE 000002CE 0B9A2948 0B9A30B8 BF9A6FF2 C4856638 *4<-
URI50.n.....?2De..*
0B9A5EC0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4856DB8
*GETFEED.rU.....?2De..*
0B9A5EE0 04080004 00000280 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A5F00 00002000 80500000 0B9D4878 00000000 00000280 00000103 D7D6C9D5 E3400000
*.....&.....POINT.....*
0B9A5F20 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4857778
*DSPURI00.rU.....?2De..*
0B9A5F40 C5D5C4C9 D9C3C1D9 F1F20004 D3002000 D9C5C3D6 D9C440D5 D6E340C6 D6E4D5C4
*ENDIRCAR12.L...RECORD NOT FOUND*
0B9A5F60 FFFFFFFF FFFFFFFF C9D4E2F1 40404040 3F000000 00000000 00000000 00000000
*.....IMS1.....*
0B9A5F80 F34C60E4 D9C9F0F0 0B97F708 00000B9E 0B9A2858 0B9A2948 BF9A6FF2 C4857B78 *3<-
URI00.p7.....?2De#.*

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0B9A5FA0 606EF4E4 D9C9F0F0 000003C0 0B94F9C8 0B9A2858 0B9A2948 BF9A6FF2 C4858B38 *-
>4URI00...m9H.....?2De.*
0B9A5FC0 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4859238
*DSPURI00.rU.....?2Dek.*
0B9A5FE0 D4D6C4C9 D9C3C1D9 F1F20070 E6082000 C9D5E2C5 D9E340D5 C5E640D9 C5C3D9C4
*MODIRCAR12..W...INSERT NEW RECRD*
0B9A6000 FFFFFFFF FFFFFFFF C9D4E2F1 40404040 3F000000 00000000 00000000 00000000
*.....IMs1.....*
0B9A6020 606EF5E4 D9C9F4F0 000020D2 0B966892 0B9A2948 0B9A30B8 BF9A6FF2 C485C538 *-
>5URI40...K.o.k.....?2De.*
0B9A6040 606EF6E4 D9C9F5F0 00000E64 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C485E0B8 *-
>6URI50...o.j.....?2De.*
0B9A6060 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C485E6B8
*DSPSTACK.ol.o.j.....?2DeW.*
0B9A6080 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C48631B8
*GETFEED.rU.....?2Df.*
0B9A60A0 A9080010 00000000 00024000 00024000 0000000C 00024000 00024000 00023000
*Z.....*
0B9A60C0 00002000 80500000 0B9D4878 0B9A3444 00000000 00000100 C7C5E340 40400000
*.....&.....GET.....*
0B9A60E0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4868EB8
*GETFEED.rU.....?2Df.*
0B9A6100 04080004 00000000 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A6120 00002000 80500000 0B9D4878 0B9A3444 00000000 00000103 D7D6C9D5 E3400000
*.....&.....POINT.....*
0B9A6140 F54C60E4 D9C9F5F0 0B9676F6 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C4869378 *5<-
URI50.o.6.....?2Df1.*
0B9A6160 606EF6E4 D9C9F5F0 00000CA0 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C48739B8 *-
>6URI50...o.j.....?2Dg.*
0B9A6180 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C4873FB8
*DSPSTACK.ol.o.j.....?2Dg.*
0B9A61A0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C4D7B4C5
*GETFEED.rU.....?2DPE.*
0B9A61C0 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A61E0 00002000 80500000 0B9D4878 0B9E5FA0 00000084 00000101 D7E4E340 40400000
*.....&.....^.....d.....PUT.....*
0B9A6200 F54C60E4 D9C9F5F0 0B967532 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C4D7E585 *5<-
URI50.o.....?2DPVe*
0B9A6220 606EF6E4 D9C9F5F0 00000CA0 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C4D81D85 *-
>6URI50...o.j.....?2DQ.e*
0B9A6240 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C4D82A45
*DSPSTACK.ol.o.j.....?2DQ.*
0B9A6260 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C51C2985
*GETFEED.rU.....?2E.e*
0B9A6280 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A62A0 00002000 80500000 0B9D4AF8 0BA03FA0 00000084 00000201 D7E4E340 40400000
*.....&.....8.....d.....PUT.....*
0B9A62C0 F54C60E4 D9C9F5F0 0B967532 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C51C3745 *5<-
URI50.o.....?2E...*
0B9A62E0 F44C60E4 D9C9F4F0 0B951A9A 000004C2 0B9A2948 0B9A30B8 BF9A6FF2 C51CB9C5 *4<-
URI40.n.....B.....?2E.E*
0B9A6300 606EF5E4 D9C9F5F0 00002184 0B969170 0B9A2948 0B9A30B8 BF9A6FF2 C51CD645 *-
>5URI50...d.o.j.....?2E.O.*
0B9A6320 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A30B8 0B9A3710 BF9A6FF2 C51CDD45
*DSPSTACK.ol.o.j.....?2E...*
0B9A6340 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C567C4BA
*GETFEED.rU.....?2E.D.*
0B9A6360 00000000 00000070 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A6380 00002000 80500000 0B9D4878 0B9E5FA0 00000070 00000101 D7E4E340 40400000
*.....&.....^.....PUT.....*
0B9A63A0 F44C60E4 D9C9F5F0 0B951B4C 000002CE 0B9A2948 0B9A30B8 BF9A6FF2 C567E4BA *4<-
URI50.n.<.....?2E.U.*
0B9A63C0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C568007A
*GETFEED.rU.....?2E...*
0B9A63E0 00000000 00000070 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A6400 00002000 80500000 0B9D4878 00000000 00000070 00000101 D7E4E340 40400000
*.....&.....PUT.....*
0B9A6420 606EF5E4 D9C9F5F0 00002184 0B969170 0B9A2948 0B9A30B8 BF9A6FF2 C5681F7A *-
>5URI50...d.o.j.....?2E...*
0B9A6440 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A30B8 0B9A3710 BF9A6FF2 C56828FA
*DSPSTACK.ol.o.j.....?2E...*
0B9A6460 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C5AA037C
*GETFEED.rU.....?2E.@*
0B9A6480 00000000 00000070 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A64A0 00002000 80500000 0B9D4AF8 0BA03FA0 00000070 00000201 D7E4E340 40400000
*.....&.....8.....PUT.....*

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0B9A64C0 F44C60E4 D9C9F5F0 0B951B4C 000002CE 0B9A2948 0B9A30B8 BF9A6FF2 C5AA173C *4<-
URI50.n.<.....?2E...*
0B9A64E0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C5AA2A3C
*GETFEED.rU.....?2E...*
0B9A6500 00000000 00000070 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
0B9A6520 00002000 80500000 0B9D4AF8 00000000 00000070 00000201 D7E4E340 40400000
*.....&.....8.....PUT...*
0B9A6540 F34C60E4 D9C9F0F0 0B97F810 00000B9E 0B9A2858 0B9A2948 BF9A6FF2 C5AA36FC *3<-
URI00.p8.....?2E...*
0B9A6560 606EF4E4 D9C9F0F0 00000448 0B94F9C8 0B9A2858 0B9A2948 BF9A6FF2 C5AA4DFC *-
>4URI00...m9H.....?2E.(.*
0B9A6580 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C5AA567C
*DSPURIO0.rU.....?2E..@*
0B9A65A0 D4D6C4C9 D9C3C1D9 F1F201D8 C5082000 C5D5C440 D4E4D3E3 40E4D7C4 C1E3C540
*MODIRCAR12.QE...END MULT UPDATE *
0B9A65C0 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*.....*
0B9A65E0 606EF5E4 D9C9F4F0 00000994 0B96688C 0B9A2948 0B9A30B8 BF9A6FF2 C5AA713C *-
>5URI40...m.o.....?2E...*
0B9A6600 606EF6E4 D9C9F3F0 000002B0 0B961C46 0B9A30B8 0B9A34C0 BF9A6FF2 C5AA867C *-
>6URI30...o.....?2E.f@*
0B9A6620 F54C60E4 D9C9F3F0 0B966B3C 00000F0E 0B9A30B8 0B9A34C0 BF9A6FF2 C62B48F8 *5<-
URI30.o.....?2F..8*
0B9A6640 606EF6E4 D9C9F5F0 00000E6A 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C62C8C38 *-
>6URI50...oj.....?2F...*
0B9A6660 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C62C94B8
*DSPSTACK.ol.oj.....?2F.m.*
0B9A6680 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C62D06F8
*GETFEED.rU.....?2F..8*
0B9A66A0 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A66C0 00002000 80500000 0B9D4878 0BB8C7F8 00000084 00000100 C7C5E340 40400000
*.....&.....G8...d....GET...*
0B9A66E0 F54C60E4 D9C9F5F0 0B9676F6 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C62D2D38 *5<-
URI50.o.6.....?2F...*
0B9A6700 606EF6E4 D9C9F5F0 000012E6 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C62D3F78 *-
>6URI50...W.oj.....?2F...*
0B9A6720 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C62D4578
*DSPSTACK.ol.oj.....?2F...*
0B9A6740 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C62D9B38
*GETFEED.rU.....?2F...*
0B9A6760 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A6780 00002000 80500000 0B9D4878 0B9A36A0 00000084 00000100 C7C5E340 40400000
*.....&.....d....GET...*

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0B9A67A0 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C66CAE78
*GETFEED.rU.....?2F%...*
0B9A67C0 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A67E0 00002000 80500000 0B9D4878 0B9A36A0 00000084 00000105 C5D9C1E2 C5400000
*.....&.....d....ERASE...*
0B9A6800 F54C60E4 D9C9F5F0 0B967B72 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C66CCD78 *5<-
URI50.o#f.....?2F%...*
0B9A6820 606EF6E4 D9C9F5F0 00000E6A 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C66CE0B8 *-
>6URI50...oj.....?2F%...*
0B9A6840 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C66CE7B8
*DSPSTACK.ol.oj.....?2F%X.*
0B9A6860 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C66D5138
*GETFEED.rU.....?2F...*
0B9A6880 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A68A0 00002000 80500000 0B9D4AF8 0BB8C7F8 00000084 00000200 C7C5E340 40400000
*.....&.....8.G8...d....GET...*
0B9A68C0 F54C60E4 D9C9F5F0 0B9676F6 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C66D67F8 *5<-
URI50.o.6.....?2F..8*
0B9A68E0 606EF6E4 D9C9F5F0 000012E6 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C66D7738 *-
>6URI50...W.oj.....?2F...*
0B9A6900 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C66D7D38
*DSPSTACK.ol.oj.....?2F...*
0B9A6920 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C66DC238
*GETFEED.rU.....?2F_B.*
0B9A6940 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*
0B9A6960 00002000 80500000 0B9D4AF8 0B9A36A0 00000084 00000200 C7C5E340 40400000
*.....&.....8.....d....GET...*
0B9A6980 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C6AA75F8
*GETFEED.rU.....?2F..8*
0B9A69A0 00000000 00000084 00024000 00024000 0000000C 00024000 00024000 00023000
*.....d.....*

```

```

OB9A69C0 00002000 80500000 0B9D4AF8 0B9A36A0 00000084 00000205 C5D9C1E2 C5400000
*.....&.....8.....d.....ERASE ...*
OB9A69E0 F54C60E4 D9C9F5F0 0B967B72 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C6AA84F8 *5<-
URI50.o#. ....?2F.d8*
OB9A6A00 606EF6E4 D9C9F5F0 00000E6A 0B969170 0B9A30B8 0B9A34C0 BF9A6FF2 C6AA9338 *-
>6URI50. ....oj.....?2F.l.*
OB9A6A20 C4E2D7E2 E3C1C3D2 8B96930A 0B969170 0B9A34C0 0B9A3B18 BF9A6FF2 C6AA99B8
*DSPSTACK.ol.oj.....?2F.r.*
OB9A6A40 C7C5E3C6 C5C5C440 0B99E480 00000000 00000000 00000000 BF9A6FF2 C6AAF3B8
*GETFEED.rU.....?2F.3.*
OB9A6A60 00000000 000000B0 00024000 00024000 0000000C 00024000 00024000 00023000
*.....*
OB9A6A80 00002000 80500000 0B9D4878 0BB8C7F8 000000B0 00000100 C7C5E340 40400000
*.....&.....G8.....GET ...*
OB9A6AA0 F54C60E4 D9C9F5F0 0B9676F6 000002CE 0B9A30B8 0B9A34C0 BF9A6FF2 C6AB0878 *5<-
URI50.o.6.....?2F...*
OB9A6AC0 606EF6E4 D9C9F3F0 000002CE 0B961C46 0B9A30B8 0B9A34C0 BF9A6FF2 C6AC60F8 *-
>6URI30. ....o.....?2F.-8*
OB9A6AE0 F54C60E4 D9C9F3F0 0B966B5A 00000F0E 0B9A30B8 0B9A34C0 BF9A6FF2 C72A23F8 *5<-
URI30.o.!.....?2G..8*
OB9A6B00 F44C60E4 D9C9F4F0 0B95035C 00000340 0B9A2948 0B9A30B8 BF9A6FF2 C72A30B8 *4<-
URI40.n.*.....?2G...*
OB9A6B20 F34C60E4 D9C9F0F0 0B97F898 00000B9E 0B9A2858 0B9A2948 BF9A6FF2 C72A3DB8 *3<-
URI00.p8q.....?2G...*
OB9A6B40 F24C60E4 D9E3F7F0 0B974420 000004A0 0B9A2220 0B9A2858 BF9A6FF2 C72A44B8 *2<-
URT70.p.....?2G...*
OB9A6B60 606EF3E4 D9C9F0F0 000003CC 0B94F9C8 0B9A2220 0B9A2858 BF9A6FF2 C72A59B8 *-
>3URI00. ....m9H.....?2G...*
OB9A6B80 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C72A61F8
*DSPURI00.rU.....?2G./8*
OB9A6BA0 D4D6C4C9 D9C3C1D9 F1F201D8 C3082000 40D3D6C7 C9C3C1D3 40C3D3D6 E2C54040 *MODIRCAR12.QC...
LOGICAL CLOSE *
OB9A6BC0 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*.....*
OB9A6BE0 606EF4E4 D9C9F0F1 000007BA 0B954A98 0B9A2858 0B9A2FC8 BF9A6FF2 C72A7A38 *-
>4URI01. ....n.q.....H...?2G...*
OB9A6C00 F34C60E4 D9C9F0F1 0B950182 0000022E 0B9A2858 0B9A2FC8 BF9A6FF2 C72A8C78 *3<-
URI01.n.b.....H...?2G...*
OB9A6C20 F24C60E4 D9C9F0F0 0B97172C 00000B9E 0B9A2220 0B9A2858 BF9A6FF2 C72A9278 *2<-
URI00.p.....?2G.k.*
OB9A6C40 F14C60E4 D9E3F0F0 0B93697A 000003F6 0B9A2010 0B9A2220 BF9A6FF2 C72A9A38 *1<-
URT00.l.....6.....?2G...*
OB9A6C60 606EF2E4 D9C9F0F0 00000318 0B94F9C8 0B9A2010 0B9A2220 BF9A6FF2 C72ABD78 *-
>2URI00. ....m9H.....?2G...*
OB9A6C80 C4E2D7E4 D9C9F0F0 0B99E480 00000000 00000000 00000000 BF9A6FF2 C72AC378
*DSPURI00.rU.....?2G.C.*
OB9A6CA0 D4D6C4C9 D9C3C1D9 F1F201D8 C3082000 40D3D6C7 C9C3C1D3 40C3D3D6 E2C54040 *MODIRCAR12.QC...
LOGICAL CLOSE *
OB9A6CC0 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
*.....*
OB9A6CE0 606EF3E4 D9C9F0F1 000007BA 0B954A98 0B9A2220 0B9A2990 BF9A6FF2 C72AD4B8 *-
>3URI01. ....n.q.....?2G.M.*
OB9A6D00 606EF4C4 C5D8F0F0 0000249A 0B90DE68 0B9A2990 0B9A3160 BF9A6FF2 C72C6D78 *-
>4DEQ00. ....?2G...*
OB9A6D20 F34C60C4 C5D8F0F0 0B956F32 000007DC 0B9A2990 0B9A3160 BF9A6FF2 C72F0878 *3<-
DEQ00.n?.....?2G...*
OB9A6D40 F24C60E4 D9C9F0F1 0B950182 0000022E 0B9A2220 0B9A2990 BF9A6FF2 C72F0E38 *2<-
URI01.n.b.....?2G...*
OB9A6D60 F14C60E4 D9C9F0F0 0B936780 00000B9E 0B9A2010 0B9A2220 BF9A6FF2 C72F13B8 *1<-
URI00.l.....?2G...*
OB9A6D80 F04C60E2 E2C9C7D5 0000C4D4 0000033E 000067B8 0B9A2010 BF9A6FF2 C72F1F38 *0<-
SSIGN..DM.....?2G...*
OB9A6DA0 C3D9E3D9 F0E7C9E3 0A7EFCB4 17172002 00000000 0B99E480 BF9A6FF2 C72F36F8
*CRTR0XIT.=.....rU...?2G..8*
OB9A6DC0 00000000 0A7D94A0 0A7EFCB4 0A807CB8 00000000 C4C6E2C2 D9D3E2C2 00000100
*.....'m..=@.....DFSBRLSB....*
OB9A6DE0 17172002 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*

```

## Related tasks

[“Locating the DBRC trace” on page 237](#)

The DBRC trace is in the IMS-formatted portion of an IMS-formatted dump. There are four ways you can locate the DBRC trace.

## DBRC external trace

If you start the Generalized Trace Facility (GTF) and issue the CHANGE.RECON TRACEON command, the DBRC trace (DSPTRACE) creates an external trace record and issues the GTRACE macro to invoke GTF.

### DBRC external trace records

The GTRACE macro passes the address and length of a DBRC external trace record to GTF. A DBRC external trace record is put in the user data area of a GTF trace record.

If more than two DBRC jobs run concurrently, the GTF data set or buffer can contain multiple trace records. Therefore, DBRC external trace records contain either the IMS subsystem ID or a job name. In a DB/DC or DBCTL environment, the SSID is added to the trace record. In other IMS environments, a job name is added to the trace record. The following table shows the format of these records.

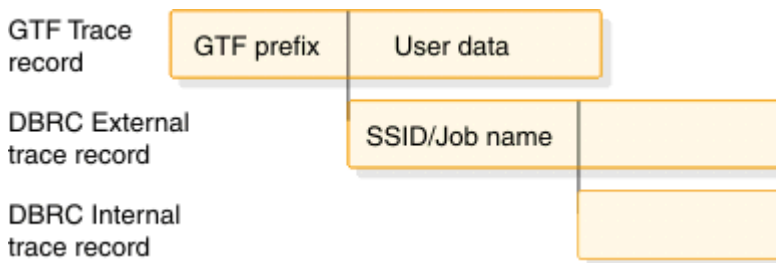


Figure 65. Format of DBRC external trace records

The GTF cataloged procedure is supplied in SYS1.PROCLIB with member name GTF or GRFSNP. If you want the DBRC trace records to be put in the GTF data set, specify MODE=EXT on the EXEC parameter and USR on the GTF option in the cataloged procedure. For detailed information about invoking GTF and its cataloged procedure, see *z/OS MVS Diagnosis: Tools and Service Aids*.

You can format and print DBRC trace records in the GTF data set by using the GTFTRACE subcommand of IPCS. You must specify the exit AMDUSRF2 on this subcommand. For detailed information about using IPCS, see *z/OS MVS Interactive Problem Control System (IPCS) User's Guide*.

### Related concepts

[“DBRC trace output” on page 237](#)

Trace output normally resides in subpool 0 storage, but you can direct output to a Generalized Trace Facility (GTF) data set.

## Examples of DBRC router processing and RECON I/O error processing output

Formatted and unformatted output for DBRC router processing and RECON I/O error processing are shown.

### DBRC external trace output

The following two examples show the unformatted and formatted output for DBRC router processing and RECON I/O error processing.

In the following figure:

- DBRCJOB1 is the job name.
- TIME is the time stamp of the trace entry.
- DSPCRTR0 passed control to the next routine to process the request identified by the DFSBRLSB.
- RQB is the address of the request level control block.
- LSB is the address of the DFSBRLSB.

- FUNC indicates the function flags (from the BRLBFFLG field of the DFSBRLSB).
- EXIT indicates the exit flags (from the BRLBEFLG field of the DFSBRLSB).

```
GTF USR Record containing DBRC Unformatted Trace Record Data
HEXFORMAT AID FF FID F2 EID EFAD
+0010 00000000 C4E2D7C3 D9E3D9F0 05F79C94 3 ....DSPCRTR0.7.m 3
+0020 17172002 00000000 00012D78 99085F22 3 .....I... 3
+0030 48397685 00000000 00000000 00D4C080 3 ...e.....Mξ. 3
+0040 00000001 00012D78 00000000 00000000 3 ..... 3
+0050 00000000 00000000 00000000 00000000 3 ..... 3
+0060 00000000 00000000 00000000 00000000 3 ..... 3
+0070 00000000 3 .... 3
```

```
Formatted Output
..... TIME=99085F2248397685 DSPCRTR0 RQB=00012D78 LSB=05F79C94 FUNC=17172002 EXIT=00000000
00000000 00000000 00D4C080 00000001 00012D78 00000000 00000000 00000000
*.....M.....*
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
```

In the following figure, a SHOWCB macro instruction is executed after the I/O request is issued.

- IMS1 is the SYSID.
- TIME is the time stamp of the trace entry.
- DSPURIO0 has control.
- RQB is the address of the request level control block.
- A locate was done. For a locate, a flag and record key are also shown in the trace record.
- RSCD is the VSAM reason code.

```
GTF USR Record containing DBRC Unformatted Trace Record Data
HEXFORMAT AID FF FID F2 EID EFAD
+0000 00FA2980 C4C2D9D6 C3E3C1D4 C9D4E2F1 | ...DBROCTAMIMS1 |
+0010 40404040 C4E2D7E4 D9C9F0F0 00012D78 | DSPURIO0... |
+0020 00000000 00000000 00000000 99085F22 | .....I.. |
+0030 48398254 C4E2D7C9 D9C3C1D9 00000190 | ..b.DSPIRCAR... |
+0040 D3002000 00000000 00000000 FFFFFFFF | L..... |
+0050 FFFFFFFF C9D4E2F1 40404040 3F000000 | ...IMS1 ... |
+0060 00000000 00000000 00000000 00000000 | ..... |
+0070 00000000
```

```
Formatted Output
DBRCJOB1 TIME=99085F2248398254 DSPURIO0 RQB=00012D78 FUNC=LOCATE
FLAG=0020
RECKEY=FFFFFFFFFFFFFFFFC9D4E2F1404040403F00000000000000000000000000000000000000
```

## Samples of JCL to create trace output

An example of a job that was used to create unformatted USR(FAD) trace output is shown.

```
//PRTUSR F2 JOB IMSCVT8,MSGLEVEL=1,CLASS=K,MSGCLASS=A,REGION=4096K
//*****
//* JOB NAME: PRINTGTF JCL *
//* JOB DEPENDENCIES: The GTF data set named below must exist. *
//* JOB Source: See the IPCS User's Guide, Appendix B. *
//* JOB DESCRIPTION: This job prints the specified GTF data set using *
//* the Batch IPCS feature. *
//*****
/*ROUTE PRINT THISCPU/IMSM3405
/*OBLIB DD DSN=IMSTESTL.TNUC0,DISP=SHR
/* DD DISP=SHR,DSN=IMSB LD.I710TS25.CRESLIB
/* DD DISP=SHR,DSN=IMSTESTG.IMS710.TSTRES
/* DD DISP=SHR,DSN=IMSTESTG.IMSQA.ACPLIB
/* DD DISP=SHR,DSN=IMSTESTG.IMSQA.PGMLIB
//JOB CAT DD DISP=SHR,DSN=VCATQAV
// DD DISP=SHR,DSN=VCATDCL
//*****
/* Print the SYS1.TRACE data set. *
/* Member BLSCDDIR resides in SYS1.SBLSCLI0, an IPCS system proclib. *
/* IT ISSUES THE DEFINE CLUSTER FOR 'DBRX06.IPCS.DDIR' ON USER01 AND *
/* catalogs it in SYS1.ECTEST.MASTER.CATALOG. *
```

```

//*****
//IPCS EXEC PGM=IKJEFT01,DYNAMNBR=20,REGION=1500K
//TRACE DD DSN=SYS1.TRACE,DISP=SHR,
// UNIT=SYSDA,VOL=SER=000000
//SYSPROC DD DSN=SYS1.SBLCLI0,DISP=SHR
//SYSTSPRT DD SYSOUT=A
//IPCSPRT DD SYSOUT=A
//IPCSTOC DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//SYSTSIN DD *
PROFILE MSGID
%BLSCDDIR DSNAME(DBRX06.IPCS.DDIR) VOLUME(USER01)
IPCS NOPARM
SETDEF DDNAME(TRACE) NOCONFIRM
GTFTRACE USR(FAD)
END
/*
//*****
//* Delete the IPCS dump directory created by the previous step *
//* so that the re-IPL of the ec machine will not orphan the data *
//* set. *
//*****
//AMS01 EXEC PGM=IDCAMS,COND=EVEN
//SYSPRINT DD SYSOUT=A
//DD1 DD UNIT=SYSDA,VOL=SER=USER01,DISP=SHR
//SYSIN DD *
DELETE DBRX06.IPCS.DDIR FILE(DD1)
/*

```

The following example is of a job that was used to create the DBRC formatted output:

```

//PRINTHMD JOB IMSCVT8,MSGLEVEL=1,CLASS=K,MSGCLASS=A,REGION=4096K
//*****
//* JOB NAME: PRINTHMD JCL *
//* JOB DEPENDENCIES: The GTF data set named below must exist. *
//* JOB Source: See the IPCS User's Guide, Appendix B. *
//* JOB DESCRIPTION: This job prints the specified GTF data set using *
//* the Batch IPCS feature. *
//*****
/*ROUTE PRINT THISCPU/IMSM3405
//JOBLIB DD DSN=IMSTESTL.TNUC0,DISP=SHR
// DD DISP=SHR,DSN=IMSB LD.I710TS25.CRESLIB
// DD DISP=SHR,DSN=IMSTESTG.IMS710.TSTRES
// DD DISP=SHR,DSN=IMSTESTG.IMSQA.ACPLIB
// DD DISP=SHR,DSN=IMSTESTG.IMSQA.PGMLIB
//JOB CAT DD DISP=SHR,DSN=VCATQAV
// DD DISP=SHR,DSN=VCATDCL
//*****
//* Print the SYS1.TRACE data set. *
//* Member BLSCDDIR resides in SYS1.SBLCLI0, an IPCS system proclib. *
//* IT ISSUES THE DEFINE CLUSTER FOR 'DBRX06.IPCS.DDIR' ON USER01 AND *
//* catalogs it in SYS1.ECTEST.MASTER.CATALOG. *
//*****
//IPCS EXEC PGM=IKJEFT01,DYNAMNBR=20,REGION=1500K
//TRACE DD DSN=SYS1.TRACE,DISP=SHR,
// UNIT=SYSDA,VOL=SER=000000
//SYSPROC DD DSN=SYS1.SBLCLI0,DISP=SHR
//SYSTSPRT DD SYSOUT=A
//IPCSPRT DD SYSOUT=A
//IPCSTOC DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//SYSTSIN DD *
PROFILE MSGID
%BLSCDDIR DSNAME(DBRX06.IPCS.DDIR) VOLUME(USER01)
IPCS NOPARM
SETDEF DDNAME(TRACE) NOCONFIRM
GTFTRACE EXIT(DSPUSRF2)
END
/*
//*****
//* Delete the IPCS dump directory created by the previous step *
//* so that the re-IPL of the ec machine will not orphan the data *
//* set. *
//*****
//AMS01 EXEC PGM=IDCAMS,COND=EVEN
//SYSPRINT DD SYSOUT=A
//DD1 DD UNIT=SYSDA,VOL=SER=USER01,DISP=SHR
//SYSIN DD *
DELETE DBRX06.IPCS.DDIR FILE(DD1)
/*

```



## Chapter 10. BPE-based DBRC service aids

BPE-based DBRC service aids help you analyze problems in BPE-based DBRC.

### BPE-based DBRC trace records

BPE-based DBRC trace records are written to one or more trace tables, and provide information that can help you determine the source of errors.

Trace record eye catchers in a formatted dump provide information about which function resulted in an error. You might be able to correct environmental problems immediately. Refer internal problems to IBM Software Support with appropriate documentation, such as system console logs and dumps.

BPE-based DBRC trace records are written to one or more of the trace tables shown in the following table.

Table 56. Trace tables for BPE-based DBRC trace records

| Table name | Number of tables | Table description                                                                                                                                                                                         |
|------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ERR        | 1                | Used to trace errors that occur within the DBRC address space. Specify as TRCLEV=(ERR,level,DBRC,PAGES=num_pages). The default number of pages for this table is 2. The ERR trace entry is 32-bytes long. |
| GRPS       | 1                | Used for DBRC group services messages and notification tracing. Specify as TRCLEV=(GRPS,level,DBRC,PAGES=num_pages). The default number of pages for this table is 8.                                     |
| MODF       | N = 1 - 256      | Used for DBRC module flow tracing. Specify as TRCLEV=(MODF,level,DBRC,PAGES=num_pages). The default number of pages for this table is 8.                                                                  |
| RQST       | N = 1 - 256      | Used for general DBRC request processing. Specify as TRCLEV=(RQST,level,DBRC,PAGES=num_pages). The default number of pages for this table is 8.                                                           |

Trace entries have the following general format:

```
0  1  2  3  4 (WD1)  8 (WD2)  C (WD3)      10                LL-B  LL-1
+-----+-----+-----+-----+-----+-----+-----+
|CD|SC| THD | DTRCALLER      | client ID | user data      | STCK      |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

#### Field name

##### Represents

#### CD

1-byte trace code field that indicates the function that wrote the trace record.

#### SC

1-byte trace subcode field that indicates the category of the trace record.

#### THD

2-byte thread sequence number.

#### WD1 - WD2

2-word trace identifier (DTRCALLR).

#### WD3

The client ID.

#### STCK

2-word system clock (STCK) that indicates the time when the trace entry was created.

The first four words and the last two words are common fields, and the rest of the information is specific to each entry.

DBRC address space trace records are mapped by macro DSPBDTR.

Trace record mapping is based on the trace subcode, which identifies the category of trace record. One particular trace subcode can apply to many trace codes. Each trace record mapping also includes a pictorial representation in a comment block.

Use the trace subcode to locate the trace record mapping in the DSPBDTR macro. The DSPBCODE macro includes 2-byte module identifier codes that are used in trace records when it is necessary to identify a DBRC module. The module identifier represents the module that wrote the trace record. The DBRC module identifiers are defined in macro DSPBCODE.

The following example shows the format of a 64-byte trace entry (MODF or GRPS trace table):

|         |    |   |     |    |     |   |      |    |      |    |      |
|---------|----|---|-----|----|-----|---|------|----|------|----|------|
| 0       | 1  | 2 | 3   | 4  | 8   | C | 10   | 14 | 18   | 1C | 1F   |
| +-----+ |    |   |     |    |     |   |      |    |      |    |      |
|         | CD |   | SC  |    | THD |   | WD1  |    | WD2  |    | WD3  |
|         |    |   |     |    |     |   | WD4  |    | WD5  |    | WD6  |
|         |    |   |     |    |     |   | WD7  |    |      |    |      |
| +-----+ |    |   |     |    |     |   |      |    |      |    |      |
|         |    |   | WD8 |    | WD9 |   | WD10 |    | WD11 |    | WD12 |
|         |    |   |     |    |     |   | WD13 |    | STCK |    |      |
| +-----+ |    |   |     |    |     |   |      |    |      |    |      |
|         |    |   |     | 20 |     |   | 24   |    |      |    | 28   |
|         |    |   |     |    |     |   | 2C   |    |      |    | 30   |
|         |    |   |     |    |     |   |      |    |      |    | 34   |
|         |    |   |     |    |     |   |      |    |      |    | 38   |
|         |    |   |     |    |     |   |      |    |      |    | 3F   |

The following example shows the format of a 128-byte trace entry (RQST trace table):

|         |    |   |     |   |     |   |      |    |      |    |      |
|---------|----|---|-----|---|-----|---|------|----|------|----|------|
| 0       | 1  | 2 | 3   | 4 | 8   | C | 10   | 14 | 18   | 1C | 1F   |
| +-----+ |    |   |     |   |     |   |      |    |      |    |      |
|         | CD |   | SC  |   | THD |   | WD1  |    | WD2  |    | WD3  |
|         |    |   |     |   |     |   | WD4  |    | WD5  |    | WD6  |
|         |    |   |     |   |     |   | WD7  |    |      |    |      |
| +-----+ |    |   |     |   |     |   |      |    |      |    |      |
|         |    |   | WD8 |   | WD9 |   | WD10 |    | WD11 |    | WD12 |
|         |    |   |     |   |     |   | WD13 |    |      |    |      |
| +-----+ |    |   |     |   |     |   |      |    |      |    |      |
|         |    |   |     |   |     |   |      |    |      |    |      |
| +-----+ |    |   |     |   |     |   |      |    |      |    |      |
|         |    |   |     |   |     |   |      |    | STCK |    |      |
| +-----+ |    |   |     |   |     |   |      |    |      |    |      |

## Trace record examples for BPE-based DBRC

These examples show formatted BPE-based DBRC trace record examples.

### DBRC I/O services trace

In the following example, the trace code is in the first byte (X'72'), which the DSPBDTR macro documents as I/O services. The eye catcher is IOSRV. The trace subcode is in the second byte (X'02'), which the DSPBDTR macro documents as RECON data set true open start. The eye catcher is True OPEN start. The 8-byte identifier in the right eye catcher for corresponding subcode is in word 1 - 2.

**Important:** An asterisk at the beginning of a subcode eye catcher indicates an error.

| Code                   | Subcode | Trace Entry                                                             |
|------------------------|---------|-------------------------------------------------------------------------|
| Trace                  | Data    |                                                                         |
| IOSRV: True OPEN start |         | 72020000 D6D7C5D5 C5D9F140 C9D4E2F1 0BD61000 00000000 00000000 00000000 |
| OPENER1                |         | 00000000 00000000 00000000 00000000 00000000 00000000 00000000          |
| 00000000               |         | 00000000 00000000 00000000 00000000 00000000 00000000 00000000          |
| 00000000               |         | 00000000 00000000 00000000 00000000 00000000 00000000 C1C4D082          |
| D9525260               |         |                                                                         |

When the identifier is DSPURI00, the block-area pointer eye catcher follows the eye catcher for subcode in the left eye catcher. In the following example, the trace subcode is in the second byte (X'01'), which the DSPBDTR macro documents as "Enter DSPURI00." The eye catcher is Enter URI00. The block-area

pointer eye catcher that follows is MODIRCAR. The 16-byte entry message for DSPURI00 is in word 12 - 15. The eye catcher is LOGICAL CLOSE.

```
Code   Subcode      Trace Entry
Trace Data
-----
IOSRV: Enter URI00 MODIRCAR  72010000 C4E2D7E4 D9C9F0F0 C9D4E2F1 0BDC0000 00000000 00000000 00000000
LOGICAL CLOSE
                                D4D6C4C9 D9C3C1D9 F1F201D8 C3082000 40D3D6C7 C9C3C1D3 40C3D3D6
E2C54040
                                40404040 40404040 40404040 40404040 40404040 40404040 00000000
00000000
                                00000000 00000000 00000000 00000000 00000000 00000000 C248B54C
F0FE19A0
```

### DBRC module flow trace

The following example shows a DBRC module flow trace.

**Important:** An asterisk at the beginning of a subcode eye catcher indicates an error.

**Module A calls module B:** The following two-line trace entry is produced when module A calls module B. A two-line trace entry is produced when module B calls DSPSTGET to obtain initial workspace storage after being called by module A. The trace code is in the first byte (X'77'), which the DSPBDTR macro documents as "Request processing." The eye catcher is RQST. The trace subcode is in the second byte (X'1A'), which the DSPBDTR macro documents as Process Flow. The eye catcher is Module entry. The 8-byte identifier in the right eye catcher for the corresponding subcode is in word 1 - 2. Word 3 represents the client ID, which is IMS1 in this example.

```
Code   Subcode      Trace Entry
Trace Data
-----
RQST : Module entry          771A0000 606EF1C4 E2E2F0F1 C9D4E2F1 8BD8C38C 0BDF5258 0BE97370 0BE97518
->1DSS01
                                00000000 00000000 00000000 00000000 00000000 00000000 C3D772C3 AC3CE200
```

```
words 1-2   Identifier that consists of:
              - An arrow (->) indicating that the module is being called.
              - The nesting level of module B. Nesting levels are shown in
                one or two decimal digits, up to 99 (nesting level 0 is DSPUIN00).
              - Last five characters of the module name being called.
word 3      Client ID.
word 4      Offset in module A of call to module B.
word 5      Entry point address of module B.
word 6      Save area address of the calling module (A).
word 7      Beginning address of the temporary storage obtained for module B
              (save area address of module B).
words 14-15 Trace time stamp.
```

**Module B calls module A:** The following two-line trace entry is produced when module B calls DSPSTFRE to release all of its temporary storage before returning to module A. The trace code is in the first byte (X'77'), which the DSPBDTR macro documents as Request processing. The eye catcher is RQST. The trace subcode is in the second byte (X'1B'), which the DSPBDTR macro documents as Process Flow. The eye catcher is Module exit. The 8-byte identifier in the right eye catcher for corresponding subcode is in word 1 - 2.

```
Code   Subcode      Trace Entry
Trace Data
-----
RQST : Module exit          771B0000 F04C60C4 E2E2F0F1 C9D4E2F1 0BD8C38C 00000236 0BE97370 0BE97518  <-
DSS01
                                00000000 00000000 00000000 00000000 00000000 00000000 C3D772D5 50228DC0
```

```

words 1-2  Identifier that consists of:
            - An arrow (->) indicating that the module is returning.
            - The nesting level of module A. Nesting levels are shown in
              one or two decimal digits, up to 99 (nesting level 0 is DSPUIN00).
            - Last five characters of the module name returning.
word 3     Client ID.
word 4     Offset in module A to which module B returns.
word 5     Offset in module B where it returns to module A.
word 6     Save area address of module A that called module B.
word 7     Beginning address of the temporary storage being released for module B
            by module DSPSTFRE.
words 14-15 Trace time stamp.

```

**DSPSTACK trace entry:** The following example shows a two-line trace entry that is produced when module B issues macro DSPGFSTK, which calls DSPSTGET to obtain additional temporary storage. The trace code is in the first byte (X'78'), which the DSPBDTR macro documents as System related. The eye catcher is SYS. The trace subcode is in the second byte (X'15'), which the DSPBDTR macro documents as Additional work space. The eye catcher is DBRC stack rqst. The 8-byte identifier in the right eye catcher for corresponding subcode is in word 1 - 2.

| Code       | Subcode    | Trace Entry                                                             |
|------------|------------|-------------------------------------------------------------------------|
| SYS : DBRC | stack rqst | 78150000 C4E2D7E2 E3C1C3D2 C9D4E2F1 8BE0B9AE 0BE0B710 0BF4D7C8 0BE98910 |
| DSPSTACK   |            | 00000000 00000000 00000000 00000000 00000000 00000000 C3D772D5 2A1BA7C0 |

```

words 1-2  Identifier DSPSTACK.
word 3     Client ID.
word 4     Return point address in the module B to which DSPSTGET returns after
            acquiring additional temporary storage for the module.
word 5     Entry point address of module B.
word 6     Save area address of module B.
word 7     Beginning address of the additional temporary storage obtained
            for module B.
words 14-15 Trace time stamp.

```

### DBRC request user exit trace

The following example shows a trace taken before the DBRC request user exit routine is called. The trace subcode is in the second byte of the trace (X'1C'), which the DSPBDTR macro documents as "Before calling user exit," as indicated in the left eye catcher field. The "BRQ0" that follows refers to the module name (DSPBRQ00) that issues the trace call. The 1-byte BRQX\_Flags field is located in the first byte of the second word of the trace. The eye catcher field on the right contains "DBRC IS BYPASSED," corresponding to the flag code (X'80' in this trace). The "END" that follows is the user exit function (BRQX\_Func), which is located in the first byte of the first word (X'02' in this trace).

**Important:** An asterisk at the beginning of a subcode eye catcher indicates an error.

| Code                   | Subcode | Trace Entry                                                                      |
|------------------------|---------|----------------------------------------------------------------------------------|
| RQST: Before exit call | BRQ0    | 771C0000 02030010 80000000 C9D4E2F1 0A8B0558 07142002 00001000 0C083000          |
| DBRC IS BYPASSED       | END     | 00000000 0A8FDE40 0A8B056C 0A91A798 00000008 C4C6E2C2 D9D3E2C2 00000100          |
|                        |         | 07142002 00001000 00000000 00000000 00000000 00000000 00000000 00000000          |
|                        |         | 00C57B78 00000001 0C083000 00000000 00000000 00000000 00000000 C4BC1081 98B16660 |

## DBRC group services trace

DBRC group services generates trace entries of two types: group services request or group services send. This type of entry means that global services is requested to do something by either its own DBRC or one of the other DBRC instances in the same IMSplex. The 8-byte identifier in the right eye catcher for corresponding request type is in word 5-6, which represents the DBRC job name.

### Group services request:

The following example shows a group services request entry.

```
Code   Subcode   Trace Entry
Trace Data
-----
GRPSV:REQ - DBRCUP   73270000 00000058 00800000 12248000 00000000 C4C2D9F8 C3E2C2C2 F4F70038
DBR8CSBB             1197A6B8 C4D5465B BC96000D 00000000 00000000 00000000 C4D5465B
C5AFF4C0
```

The following tables describes useful fields and their possible values:

*Table 57. Word 1 eye catchers for the group services request*

| Word 1 | Eye catcher | Request type                                                                       |
|--------|-------------|------------------------------------------------------------------------------------|
| X'50'  | INIT        | Initialize global services.                                                        |
| X'51'  | NOTQUIESCE  | Another DBRC is telling this DBRC that RECON data set access is allowed.           |
| X'52'  | QUIESCE     | This DBRC wants exclusive RECON data set access.                                   |
| X'53'  | QUACK       | Another DBRC acknowledges this DBRC's request for exclusive RECON data set access. |
| X'54'  | ENDQUIESCE  | This DBRC releases RECON data sets to other DBRCs again.                           |
| X'55'  | ENDQUACK    | Another DBRC acknowledges renewed RECON data set access.                           |
| X'56'  | GOTQUIESCE  | Another DBRC wants exclusive RECON data set access.                                |
| X'57'  | GOTENDQUIES | Another DBRC releases its exclusive RECON data set access.                         |
| X'58'  | DBRCUP      | A new DBRC joined the IMSplex.                                                     |
| X'59'  | DBRCDOWN    | A DBRC left the IMSplex.                                                           |
| X'5A'  | SCIUP       | Local SCI is active.                                                               |
| X'5B'  | SCIDOWN     | Local SCI is down.                                                                 |
| X'5C'  | RCNLOSS     | This DBRC wants to notify other DBRCs of a RECON loss.                             |
| X'5D'  | RESEND      | Another DBRC wants this DBRC to resend its last request.                           |
| X'5E'  | GRP2DONE    | Local processing complete for request types 56 or 57.                              |
| X'5F'  | GOTRCNLOSS  | RECON loss notification from another DBRC.                                         |
| X'60'  | ID          | Another DBRC informs this DBRC of its SSID.                                        |

*Table 58. Words 4 -10 request types for the group services request*

| Word   | Request type             |
|--------|--------------------------|
| Word 4 | Message sequence number. |

Table 58. Words 4 -10 request types for the group services request (continued)

| Word       | Request type                                                                                                                                                                                                                                                       |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | Meaningful only for requests from other DBRCs (request types 51, 53, 55, 56, 5D, 5F, 60). Each DBRC assigns a sequence number to every new request that it sends. If a request is resent, it contains the same sequence number that was originally assigned to it. |
| Words 5-6  | For requests from other DBRCs, the job name of the other DBRC.                                                                                                                                                                                                     |
| Words 7-10 | The SCI token associated with the request. Can be used to distinguish between DBRCs if the job name is not unique.                                                                                                                                                 |

**Group services send:**

The following example shows a group services send entry. This type of entry means that group services is sending a message to another DBRC.

```
Code      Subcode      Trace Entry
Trace Data
-----
GRPSV:SEND - NOTQUIESCE      73280000 00000001 00000000 00000002 00000000 00000000 00000000 00000000
                                00000000 00000000 00000000 00000000 00000000 00000000 C4D5465B C5B11020
```

The following list describes useful fields and their possible values:

Table 59. Word 1 eye catchers for the group services request

| Word 1 | Eye catcher | Message type                                                                         |
|--------|-------------|--------------------------------------------------------------------------------------|
| X'01'  | NOTQUIESCE  | RECON access is allowed.                                                             |
| X'02'  | RCNLOSS     | RECON loss notification.                                                             |
| X'03'  | QUIESCE     | Request for exclusive RECON access.                                                  |
| X'04'  | QUIESCECLS  | Request for exclusive RECON access and that the recipient close the RECON data sets. |
| X'05'  | QUACK       | Acknowledge the request for exclusive RECON access.                                  |
| X'06'  | ENDQUIESCE  | Release exclusive RECON access by this DBRC.                                         |
| X'07'  | ENDQUACK    | Acknowledge release of exclusive RECON access.                                       |
| X'08'  | RESEND      | Request resend of another DBRC's last request.                                       |
| X'09'  | ID          | Send SSID to another DBRC.                                                           |

Table 60. Words 3 and 4 message types for the group services request

| Word   | Request type                                                                                                          |
|--------|-----------------------------------------------------------------------------------------------------------------------|
| Word 3 | Message sequence number.                                                                                              |
| Word 4 | If the message is a response to a message from another DBRC, this is the sequence number of the other DBRC's message. |

**Related concepts**

[Planning for recovery \(System Administration\)](#)

## Unformatted BPE-based DBRC internal trace example

The module-call entries, module return entries, DSPURI00 trace entries, and other entries (such as GETFEED, DSPCRTR0, and CRTR0XIT) are shown in this trace example.

In this example, client ID is 5 for all requests.

```
OB9A5440 20010016 C4E2D7C3 D9E3D9F0 00000005 0A315CB4 17172002 00000000 0B99E480
|....DSPCRTR0.....*.....rU.|
OB9A5460 00000000 00000000 00C4CD28 00000001 0B99E480 00000000 00000000 00000000
|.....D.....rU.....|
OB9A5480 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
|.....|
OB9A54A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDECAB7
|.....>...|
OB9A54C0 06010016 606EF1E2 E2C9C7D5 00000005 8000C4E4 0B93A950 000067B8 0B9A2010 |....-
>1SSIGN.....DU.lz&.....|
OB9A54E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF13B7
|.....>...|
OB9A5500 20010018 C4E2D7C3 D9E3D9F0 00000005 0A315CB4 17172002 00000000 0B99E480
|....DSPCRTR0.....*.....rU.|
OB9A5520 00000000 00000000 00C4CD28 00000001 0B99E480 00000000 00000000 00000000
|.....D.....rU.....|
OB9A5540 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
|.....|
OB9A5560 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDECAB7
|.....>...|
OB9A5580 20080016 606EF2E4 D9C9F0F0 00000005 00000258 0B953A20 0B9A2010 0B9A2220 |....-
>2URI00.....n.....|
OB9A55A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF4577
|.....>...|
OB9A55C0 06010018 606EF1E2 E2C9C7D5 00000005 8000C4E4 0B93A950 000067B8 0B9A2010 |....-
>1SSIGN.....DU.lz&.....|
OB9A55E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF13B7
|.....>...|
OB9A5600 20080018 606EF2E4 D9C9F0F0 00000005 00000258 0B953A20 0B9A2010 0B9A2220 |....-
>2URI00.....n.....|
OB9A5620 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF4577
|.....>...|
OB9A5640 06010018 C4E2D7E4 D9C9F0F0 00000005 0B99E480 00000000 00000000 00000000
|....DSPURI00.....rU.....|
OB9A5660 D4D6C9C4 D9C3C1D9 F1F201D8 D6000000 40D3D6C7 C9C3C1D3 40D6D7C5 D5404040 |MODIRCAR12.QO...
LOGICAL OPEN |
OB9A5680 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
|.....|
OB9A56A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF6E37
|.....>.>..|
OB9A56C0 20020018 606EF3E4 D9C9F0F1 00000005 000007A4 0B903088 0B9A2220 0B9A2990 |....-
>3URI01.....u...h.....|
OB9A56E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDFCE77
|.....>...|
OB9A5700 06010016 C4E2D7E4 D9C9F0F0 00000005 0B99E480 00000000 00000000 00000000
|....DSPURI00.....rU.....|
OB9A5720 D4D6C9C4 D9C3C1D9 F1F201D8 D6000000 40D3D6C7 C9C3C1D3 40D6D7C5 D5404040 |MODIRCAR12.QO...
LOGICAL OPEN |
OB9A5740 40404040 40404040 40404040 40404040 40404040 40404040 00000000 00000000
|.....|
OB9A5760 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDF6E37
|.....>.>..|
OB9A5780 20020016 606EF3E4 D9C9F0F1 00000005 000007A4 0B903088 0B9A2220 0B9A2990 |....-
>3URI01.....u...h.....|
OB9A57A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDFCE77
|.....>...|
OB9A57C0 20060018 606EF4D9 E2E5F0F0 00000005 0000EE6 0B998AE8 0B9A2990 0B9A3170 |....-
>4RSV00.....w.r.Y.....|
OB9A57E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDFF577
|.....>.5..|
OB9A5800 20060016 606EF4D9 E2E5F0F0 00000005 0000EE6 0B998AE8 0B9A2990 0B9A3170 |....-
>4RSV00.....w.r.Y.....|
OB9A5820 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EDFF577
|.....>.5..|
OB9A5840 20060018 F34C60D9 E2E5F0F0 00000005 0B903F6E 00000234 0B9A2990 0B9A3170 |....3<-
RSV00.....>.....|
OB9A5860 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE005F7
|.....>.7..|
OB9A5880 20060016 F34C60D9 E2E5F0F0 00000005 0B903F6E 00000234 0B9A2990 0B9A3170 |....3<-
RSV00.....>.....|
OB9A58A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE005F7
|.....>.7..|
```

```

0B9A58C0 20040018 606EF4E4 D9C9F3F0 00000005 00000F9C 0B961D24 0B9A2990 0B9A3170 |....-
>4URI30.....o.....|
0B9A58E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE036B7
|.....>...|
0B9A5900 20030018 606EF5E4 D9C9F2F0 00000005 000010E2 0B95FEC2 0B9A3170 0B9A3B08 |....-
>5URI20.....S.n.B.....|
0B9A5920 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE058B7
|.....>...|
0B9A5940 20030018 F44C60E4 D9C9F2F0 00000005 0B962E06 00000A10 0B9A3170 0B9A3B08 |....4<-
URI20.....o.....|
0B9A5960 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE06E77
|.....>..|
0B9A5980 20040016 606EF4E4 D9C9F3F0 00000005 00000F9C 0B961D24 0B9A2990 0B9A3170 |....-
>4URI30.....o.....|
0B9A59A0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE036B7
|.....>...|
0B9A59C0 20030016 606EF5E4 D9C9F2F0 00000005 000010E2 0B95FEC2 0B9A3170 0B9A3B08 |....-
>5URI20.....S.n.B.....|
0B9A59E0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE058B7
|.....>...|
0B9A5A00 20030016 F44C60E4 D9C9F2F0 00000005 0B962E06 00000A10 0B9A3170 0B9A3B08 |....4<-
URI20.....o.....|
0B9A5A20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE06E77
|.....>..|
0B9A5A40 20030018 606EF5E4 D9C9F2F0 00000005 000010E2 0B95FEC2 0B9A3170 0B9A3B08 |....-
>5URI20.....S.n.B.....|
0B9A5A60 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE058B7
|.....>...|
0B9A5A80 20040018 F34C60E4 D9C9F3F0 00000005 0B904024 0000106C 0B9A2990 0B9A3170 |....3<-
URI30.....%.....|
0B9A5AA0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE07637
|.....>...|
0B9A5AC0 20050018 606EF4E4 D9C9F5F0 00000005 000029AA 0B969248 0B9A2990 0B9A3170 |....-
>4URI50.....ok.....|
0B9A5AE0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE0F1B7
|.....>.1.|
0B9A5B00 20030016 606EF5E4 D9C9F2F0 00000005 000010E2 0B95FEC2 0B9A3170 0B9A3B08 |....-
>5URI20.....S.n.B.....|
0B9A5B20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE058B7
|.....>...|
0B9A5B40 20040016 F34C60E4 D9C9F3F0 00000005 0B904024 0000106C 0B9A2990 0B9A3170 |....3<-
URI30.....%.....|
0B9A5B60 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE07637
|.....>...|
0B9A5B80 060A0018 C4E2D7E2 E3C1C3D2 00000005 8B9693E2 0B969248 0B9A3170 0B9A37C8
|...DSPSTACK....o1S.ok.....H|
0B9A5BA0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE0FAB7
|.....>...|
0B9A5BC0 20070018 606EF5D9 E3E7C4F0 00000005 00000430 0B92D988 0B9A3170 0B9A3870 |....-
>5RTXD0.....kRh.....|
0B9A5BE0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE11037
|.....>...|
0B9A5C00 20070018 F44C60D9 E3E7C4F0 00000005 0B969678 000002AE 0B9A3170 0B9A3870 |....4<-
RTXD0.....oo.....|
0B9A5C20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE15CF7
|.....>.*7|
0B9A5C40 060A0018 C7C5E3C6 C5C5C440 00000005 0B99E480 00000000 00000000 00000000
|...GETFEED....rU.....|
0B9A5C60 00000000 00000280 00000000 00000000 00000001 00020000 00020000 00007FF8
|....."8|
0B9A5C80 00000080 80100000 0B9CD878 0B9CA57C 00000280 00000100 C7C5E340 40400000
|.....Q...v@.....GET...|
0B9A5CA0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F11A877
|.....?..y..|
0B9A5CC0 20050016 606EF4E4 D9C9F5F0 00000005 000029AA 0B969248 0B9A2990 0B9A3170 |....-
>4URI50.....ok.....|
0B9A5CE0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE0F1B7
|.....>.1.|
0B9A5D00 060A0016 C4E2D7E2 E3C1C3D2 00000005 8B9693E2 0B969248 0B9A3170 0B9A37C8
|...DSPSTACK....o1S.ok.....H|
0B9A5D20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE0FAB7
|.....>...|
0B9A5D40 20070016 606EF5D9 E3E7C4F0 00000005 00000430 0B92D988 0B9A3170 0B9A3870 |....-
>5RTXD0.....kRh.....|
0B9A5D60 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE11037
|.....>...|
0B9A5D80 20070016 F44C60D9 E3E7C4F0 00000005 0B969678 000002AE 0B9A3170 0B9A3870 |....4<-
RTXD0.....oo.....|
0B9A5DA0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6EE15CF7
|.....>.*7|
0B9A5DC0 060A0016 C7C5E3C6 C5C5C440 00000005 0B99E480 00000000 00000000 00000000
|...GETFEED....rU.....|

```



```

0B9A5DE0 00000000 00000280 00000000 00000000 00000001 00020000 00020000 00007FF8
|....."8|
0B9A5E00 00000080 80100000 0B9CD878 0B9CA57C 00000280 00000100 C7C5E340 40400000
|.....Q...v@.....GET ..|
0B9A5E20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F11A877
|.....?..y.|
0B9A5E40 20070018 606EF5D9 E3E7C4F0 00000005 00000876 0B92D988 0B9A3170 0B9A3870 |....-
>5RTXD0.....kRh.....|
0B9A5E60 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F11BAF7
|.....?..7|
0B9A5E80 20070018 F44C60D9 E3E7C4F0 00000005 0B969ABE 000002AE 0B9A3170 0B9A3870 |....4<-
RTXD0.....o.....|
0B9A5EA0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F120B77
|.....?....|
0B9A5EC0 20070016 606EF5D9 E3E7C4F0 00000005 00000876 0B92D988 0B9A3170 0B9A3870 |....-
>5RTXD0.....kRh.....|
0B9A5EE0 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F11BAF7
|.....?..7|
0B9A5F00 20070016 F44C60D9 E3E7C4F0 00000005 0B969ABE 000002AE 0B9A3170 0B9A3870 |....4<-
RTXD0.....o.....|
0B9A5F20 00000000 00000000 00000000 00000000 00000000 00000000 BF3069CF 6F120B77 |.....

```



---

# Chapter 11. Data communication service aids

Data communication service aids, such as Terminal communication task trace and DC Trace are described.

## Terminal communication task trace

---

When an output device (such as a terminal, line, or node) hangs, you can use the terminal communication task trace to diagnose the problem.

You can use information you find in the terminal communication task trace to build keywords for your search string, or you can use the information when you are reviewing existing APAR descriptions to determine whether they describe the problem you are experiencing.

All IMS terminal communication tasks are dispatched by the IMS communication analyzer (module DFSICIO0). This module traces its own flow, as well as the flow through device-dependent modules, by using register 0 of the save area of the communication analyzer. (For this reason, this trace is often referred to as the REG0 trace.) The communication analyzer uses the high-order 2 bytes of register 0 to trace the analyzer entry point, and uses the low-order 2 bytes to trace the device-dependent module entry point.

In the DC section of the IMS dump, find the save area sets that hold data about the various IMS processes that were executing prior to the dump. If one of these save areas sets is for DFSICIO0, you can then look at the corresponding register 0 to find the communication task trace entries.

### Related reference

[“Log records” on page 515](#)

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

## Analyzer entry points

The high-order 2 bytes of register 0 (for module DFSICIO0) identify the analyzer entry points.

### Entry points

#### Analyzer entry point (hex)

|   | Processing description                                                                        |
|---|-----------------------------------------------------------------------------------------------|
| 1 | Process an input segment from a terminal.                                                     |
| 2 | Perform a logical read operation to the terminal.                                             |
| 3 | Determine which system function is to be performed next for this line and terminal (or node). |
| 4 | Issue a GET NEXT call to message queue.                                                       |
| 5 | Perform a logical write operation to the terminal.                                            |
| 6 | WRITE successful; dequeue message or call the device-dependent module at DD1.                 |
| 7 | Notify master terminal of I/O error; cancel input; return output message to queue.            |
| 8 | Return output message to queue; cancel input.                                                 |

- 9** Generate an error message; cancel input; return output message to queue.
- A** Idle the line; cancel output; return output message to queue.
- B** Resend the last message sent from a given logical terminal (LTERM).
- C** Idle the line.

The low-order 2 bytes of register 0 identify the entry points for the device-dependent modules (DDMs), as listed below:

**DDM entry point (hex)**

- | <b>Processing description</b>                                                                              |
|------------------------------------------------------------------------------------------------------------|
| <b>1</b> WRITE/SEND setup: Set up output buffer to write current buffer.                                   |
| <b>2</b> WRITE/SEND interruption: Error check last output operation.                                       |
| <b>3</b> READ/RECEIVE setup: Set up to perform a poll or read.                                             |
| <b>4</b> READ/RECEIVE interruption: Error check, determine terminal responding, and deblock input segment. |
| <b>5</b> Cleanup: Restore control blocks after DFSIC100 error.                                             |
| <b>6</b> Build: Move output message from a queue buffer (MFS buffer) to a line buffer.                     |
| <b>7</b> Logon: VTAM OPNDST/CLSDST processing.                                                             |
| <b>8</b> Prepare for output: VTAM                                                                          |
| <b>F</b> MFS output format control (DFSCOF0) was entered.                                                  |

**Trace records**

Example trace records for the terminal communication task trace are described.

The entries in the first 2 bytes indicate the processing that the analyzer (DFSIC100) has completed. The entries in the last 2 bytes indicate the processing that the device-dependent modules (DDMs) have completed. As new entries are added, existing entries shift to the left. When the 2-byte area fills, the oldest entry is overwritten by the next-oldest entry. Therefore, the right-most entry of each 2-byte portion of register 0 identifies the most recent analyzer or device-dependent module activity.

The following figure shows the format of a sample terminal communications task trace record.

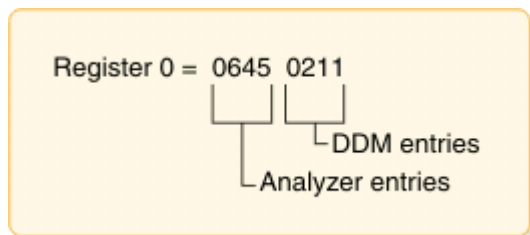


Figure 66. Example of a terminal communication task trace entry

The sample terminal communication task trace entry in the figure indicates that the analyzer entries are 6, 4, and 5; DDM entries are 2, 1, and 1. An analysis of this trace data would yield the flow information shown in the following table.

*Table 61. Example processing flow for a terminal communication task trace entry*

| Entry point | Trace ID | Processing description                                                                                                 |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------|
| 2           | DDM2     | A write interrupt occurred.                                                                                            |
| 6           | A06      | A write completed successfully.                                                                                        |
| 1           | DDM1     | Another buffer was required.                                                                                           |
| 4           | A04      | Room in the buffer is allowed for another message segment. (GN was issued to the message queue.)                       |
| 1           | DDM1     | This segment was placed in the buffer, filling it or an EOM was detected. Setup for the write operation was completed. |
| 5           | A05      | An output operation was requested.                                                                                     |

## Trace output

You can find the terminal communication task trace in any IMS dump, either in register 0 (corresponding to module DFSICIO0) or in the CLB section of the dump for the terminal involved in the problem.

If you look at the CLB section of the dump, the information in field CLBTEMP1 is the same as what is in register 0. Fields CLBTEMP4 and CLBTEMP5 contain the Julian date and time at which the IMS task (ITASK) associated with the line or node returned to the IMS dispatcher (module DFSIDSP0). This information is useful when diagnosing a hung or lost terminal. In an IMS control region dump, you can determine when the last activity occurred on the line or node and what processing path was taken.

## DC trace

The data communication (DC) trace enables you to obtain information about the program flow within the communications analyzer and between the analyzer and the device dependent modules (DDMs).

### Related reference

“Diagnosing Message Format Service problems” on page 314

The number of physical terminals traced and the number of lines traced can affect completeness of trace records and sequence of trace entries.

## Starting the trace

To start the DC trace for any terminal in the IMS network, enter one of the /TRACE commands from the master terminal or the z/OS console.

Specify at least level 3 in the command because buffer contents are usually required for complete diagnosis. If you specify level 4, the trace writes a save area set for certain entries (C00-C12, D05, AER1, and AER2).

- For VTAM terminals:

```
/TRACE SET ON NODE P1 LEVEL 1|2|3|4 MODULE DDM|MFS|ALL
```

- For ISC links:

```
/TRACE SET ON NODE P1 LEVEL=1|2|3|4 MODULE DDM|MFS|ALL
OR
/TRACE SET ON NODE P1 USER P2
```

- For logical LINKs:

```
/TRACE SET ON LINK P1,...,Pn|ALL LEVEL 1|2|3|4 MODULE DDM|MFS|ALL
```

- For UNITTYPE:

```
/TRACE SET ON UNITTYPE P1,...,Pn LEVEL 1|2|3|4 MODULE DDM|MFS|ALL
UPDATE MSLINK NAME(linkname|linkname*|*) START(TRACE)
```

**Note:** The type-2 command **UPDATE MSLINK NAME(linkname) START(TRACE)** uses the same level and module settings that were used the last time the **/TRACE SET (ON) LINK** command was issued. If a **/TRACE SET (ON) LINK** command has not been issued since the last cold start, this command defaults to **MODULE=ALL** and **LEVEL=4**.

- For an XRF environment:

```
/TRACE SET ON NODE xxx TAKEOVER
/TRACE SET ON LINE xxx TAKEOVER
/TRACE SET ON LINK xxx TAKEOVER
UPDATE MSLINK NAME(linkname) START(TRACE) SET(TKOTRC((Y))
```

**Tip:**

- The **/TRACE SET ON NODExxx TAKEOVER** command starts the trace for the specified terminals during takeover only.
- You can enter this command only from the active system in an XRF environment.
- After a terminal has switched successfully, the trace is automatically turned off for that terminal.
- Because this command is recovered across restart and takeover, you need to enter it only once. After a cold start, you must enter the command again.
- Tracing occurs only if the session was active at the time of the takeover.
- If you enter a **/TRACE** command with and without the **TAKEOVER** keyword, the last command you entered is in effect.
- You can issue this command for VTAM nodes and MSC links during takeover.
- The **/TRACE SET OFF NODE xxx TAKEOVER**, **/TRACE SET OFF LINE xxx TAKEOVER**, **/TRACE SET OFF LINK xxx TAKEOVER** or **UPDATE MSLINK NAME (linkname) STOP(TRACE) SET(TKOTRC(N))** command turns off the trace anytime before takeover.

## Stopping the trace

To stop the DC trace, enter one of the **/TRACE SET OFF** commands from the master terminal or the z/OS console.

- For VTAM terminals:

```
/TRACE SET OFF NODE P1
```

- For ISC links:

```
/TRACE SET OFF NODE P1
O I
/TRACE SET OFF NODE P1 USER P2
```

- For logical LINKs:

```
/TRACE SET OFF LINK P1,...,Pn|ALL
```

- For UNITTYPE:

```
/TRACE SET OFF UNITTYPE P1,...,Pn
UPDATE MSLINK NAME(linkname|linkname*|*) START(TRACE)
```

- For an XRF environment:

```
/TRACE SET OFF NODE xxx TAKEOVER
```

```

/TRACE SET OFF LINE xxx TAKEOVER

/TRACE SET OFF LINK xxx TAKEOVER
UPDATE MSLINK NAME(linkname) STOP(TKOTRC)

```

## Printing the trace records

To format and print the trace records, use the File Select and Formatting Print utility (DFSERA10).

The DC trace snaps DC control blocks and I/O buffers to the OLDS/WADS as X'6701' log records. These records are archived to the system log data set (SLDS).

To format and print the trace records, use the following method:

- **File Select and Formatting Print utility (DFSERA10)**

To use the File Select and Formatting Print utility (DFSERA10), specify E=DFSERA30 to format the records before printing. The following example shows the JCL you might use to print DC trace records.

```

// JOB jobname
//S EXEC PGM=DFSERA10
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=DSN of SLDS,.....
//SYSIN DD *
CONTROL CNTL
OPTION PRINT 0=5,V=6701,L=2,T=X,E=DFSERA30
//

```

where

O = Offset  
L = Length  
V = Value  
T = Type  
E = Exit

Even if the DC trace was started for many terminals, you can print trace entries for a specific terminal by using the following OPTION statement.

```

CONTROL CNTL DDNAME=...
OPTION PRINT 0=5,T=X,L=1,V=67,C=M
OPTION PRINT 0=89,T=C,L=8,V=xxxxxxxx,C=E,E=DFSERA30

```

where xxxxxxxx = terminal (node) name

A trace record might span several X'6701' log records. If you use the OPTIONS statements, only the first log record is printed.

### Related reference

[“Content of the trace records” on page 273](#)

You can evaluate DC trace records while debugging errors, building keywords, or evaluating APAR descriptions.

## Content of the trace records

You can evaluate DC trace records while debugging errors, building keywords, or evaluating APAR descriptions.

You can evaluate DC trace records during any of the following tasks:

- Debugging user errors in exit routines or user modifications relating to communications
- Debugging errors in other entities in the communication network (such as programmable terminals or other host processors)
- Building a keyword string to search for known problems
- Evaluating existing APAR descriptions to isolate problems that are most like the one you are experiencing

The first line of each trace record shows the ID:

```
ID= xxx   SEGNO= mm RECNO= nnnnnnnn TIME HH.MM.SS.TT DATE YY.DDD
```

xxx can be any of the following trace record identifiers (IDs):<sup>1</sup>

**ID**

**Description**

**A xx**

Communication analyzer activity (DFSICIO0)

**AERx**

Access method error

**C xx**

Communication analyzer activity (DFSCIO0 in DFSICIO0)

**CI04**

TM shared queues re-read error detected

**CI02**

Device-dependent module (DDM) SDC read for output

**CI03**

Device-dependent module (DDM) conditional SDC *wash* output

**CMEA**

Before calling Message Control/Error exit DFSCMUX0

**CMEB**

After calling Message Control/Error exit DFSCMUX0

**CMEI**

Message Control/Error exit interface processing

**COFC**

Entry to the output format control, MFS-supported devices (DFSCOFC0)

**CRTU**

Output User Creation user exit routine failure

**CTTR**

ISC TCPIP Trace ABORT.

**CVCT**

VTAM trace. This log record is written even though DC trace is not active on the terminal/link.

**CVCV**

XRF class 2 takeover trace. This log record is written for XRF class 2 terminals during takeover, even though DC trace is not active on the terminal.

**D xx**

Device-dependent module (DDM) activity

**DDxx**

Output processing by DFSCOFC0

**DSIM**

SIMLOGON attempt of a dynamic terminal

**ESIM**

SIMLOGON error for a dynamic terminal

**FERR**

MFS-block fetch error

**FESx**

Front-end switch user exit routine activity

---

<sup>1</sup> An asterisk (\*) in this list is a wildcard character, meaning that any character can replace the asterisk.



**FEXT**

Before field edit exit routine

**FMTx**

Message Format Service activity (MFS)

**HCSW**

XRF class 1 takeover trace. This log record is written for XRF class 1 terminals during takeover, even though DC trace is not active on the terminal.

**ICLR**

Message router activity

**INIT**

Device-dependent module (DDM) for ISC TCP/IP that sends session initiation requests.

**IRxx**

Device-dependent module (DDM) for ISC TCP/IP that reads input messages that use the IBM CICS Transaction Server for z/OS IPIC protocol.

**IWxx**

Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.

**MFSP**

MFS activity to detect change in the content of a protected field that is in the input from a 3270 or SLU2 device. Set MFSPFV=Y in the DFSDCxxx member of the IMS PROCLIB data set to configure this option. This log record is written even though DC trace is not active on the terminal.

**MSGs**

Device-dependent module (DDM) for ISC TCP/IP that sends messages that use the CICS IPIC protocol.

**MTRP**

Block verification error

**RESP**

Device-dependent module (DDM) for ISC TCP/IP that sends ACK/NAK messages that use the CICS IPIC protocol.

**SDC1**

Device-dependent module (DDM) SDC output read error

**SDC2**

Device-dependent module (DDM) SDC message reread error

**SEXT**

Before segment edit exit routine

**SGNX**

Signon user exit routine failure

**SPCL**

Close spool data set

**SPOP**

Open spool data set

**SPRE**

Read spool data set

**SPWR**

Write spool data set

**TERM**

Device-dependent module (DDM) for ISC TCP/IP that sends session termination requests.

**TRCE**

Non-SNA 3270 error

**VTPO**

Non-posting of ECB trace (DFSVTPO0)

**Exception:** MSC has its own analyzer module and entry types.

The table below shows the types of data communication (DC) trace records and what each trace record contains. Some of the acronyms used in the table are:

**SEG**

Segment (DECAREA buffer)

**MFS**

MFS input work/MFS output work/MFS protect work

**QBUF**

Queue buffer

**IOPUF**

TP buffer

**S25**

Save area 2-5

**SALL**

Save area all

Table 62. DC trace records

| Trace ID | Function                                                 | Traced by                                | When traced or / TRACE option | What is traced                                                                                    |
|----------|----------------------------------------------------------|------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------|
| A01      | Process input. <a href="#">"1" on page 281</a>           | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CXB, CRB, CIB, CCB, QBUF, IOBUF, INPCNTS, OUTCNTS, EMHB <a href="#">"2" on page 281</a> |
| A02      | Do read. <a href="#">"1" on page 281</a>                 | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CXB, CRB, IOBUF, EMHB <a href="#">"2" on page 281</a>                                   |
| A03      | What is next.                                            | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CRB, CTT                                                                                |
| A04      | Get Next segment.                                        | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT                                                                                     |
| A05      | Do write. <a href="#">"1" on page 281</a>                | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CXB, CRB, CCB, IOBUF, EMHB <a href="#">"2" on page 281</a>                              |
| A06      | After good write.                                        | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | IOB, CTB, CLB, CXB, CRB, CCB                                                                      |
| A07      | After bad write. <a href="#">"1" on page 281</a>         | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | IOB, CTB, CLB, CRB, CCB, IOBUF, EMHB <a href="#">"2" on page 281</a>                              |
| A08      | Cancel message, do not DEQ.                              | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CRB                                                                                     |
| A09      | Generate system message. <a href="#">"1" on page 281</a> | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CRB, MFS                                                                                |
| A10      | Quiesce without stopping.                                | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CRB, CCB                                                                                |
| A11      | Retrieve last DEQD message.                              | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT, CRB                                                                                |
| A12      | Wait for ASYNC I/O or output ENQ.                        | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CRB, CCB, IOBUF, EMHB <a href="#">"2" on page 281</a>                                   |
| AER1     | Access method error.                                     | DFSICIO0 <a href="#">"9" on page 282</a> | Always                        | CTB, CLB, CNT, QBUF, SALL, CTT, PCB                                                               |

Table 62. DC trace records (continued)

| Trace ID | Function                                              | Traced by                | When traced or / TRACE option | What is traced                                                                            |
|----------|-------------------------------------------------------|--------------------------|-------------------------------|-------------------------------------------------------------------------------------------|
| AER2     | Access method error. "3" on page 281, "1" on page 281 | DFSICIO0 "9" on page 282 | Always                        | IOB, CTB, CLB, CNT, CXB, CRB, CIB, CCB, QBUF, IOBUF, SALL, CTT, PCB, EMHB "2" on page 281 |
| C00      | Get queue buffer.                                     | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C01      | Reposition queue buffer.                              | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C02      | Get Next.                                             | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C03      | DEQ output.                                           | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C04      | Place output back in queue.                           | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C05      | Find output.                                          | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C06      | Get new output message or QMGR call.                  | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C07      | Free input buffer.                                    | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C08      | Get output buffer.                                    | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C09      | User output edit.                                     | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C10      | Call queue MGR.                                       | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C11      | Get device-dependent module (DDM) work buffer.        | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C12      | Free device-dependent module (DDM) work buffer.       | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| C13      | Free receive-any buffer.                              | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CNT, CIB, SALL                                                                       |
| CIO2     | Device-dependent module (DDM) SDC read output         | DFSCIO20                 | ALL DDM                       | copy ctl blk list from CVCT entry                                                         |
| CIO3     | Device-dependent module (DDM) SDC wash output         | DFSCIO30                 | ALL DDM                       | copy ctl blk list from CVCT entry                                                         |
| CMEA     | Before call MSG CTRL Error exit.                      | DFSCMEIO                 | Before call DFSCMUX0          | If ITASK is a CLB or LLB: CTB, CLB, CRB, QBUF, IOBUF, INP/OUTP CNTS, DDM, MSNB            |

Table 62. DC trace records (continued)

| Trace ID | Function                                              | Traced by                                | When traced or / TRACE option | What is traced                                                                                                            |
|----------|-------------------------------------------------------|------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| CMEB     | After call MSG CTRL Error exit.                       | DFSCMEI0                                 | After call DFSCMUX0           | If ITASK is a CLB or LLB: CTB, CLB, CRB, QBUF, IOBUF, INP/OUTP CNTS, DDM, MSNB If ITASK is a PST: PST, MSGPRFX, SMB, MSNB |
| CMEI     | Error procedure in DFSCMEI0.                          | DFSCMEI0                                 | On some errors                | If ITASK is a CLB or LLB: CTB, CLB, CRB, QBUF, IOBUF, INP/OUTP CNTS, DDM, MSNB If ITASK is a PST: PST, MSGPRFX, SMB, MSNB |
| COFC     | Let MFS edit output.                                  | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, IOBUF, EMHB <a href="#">"2" on page 281</a>                                                      |
| CRTU     | Output User Creation exit routine failure.            | DFSCRTU0                                 | Always                        | See notes <a href="#">"10" on page 282</a>                                                                                |
| CTTR     | ISC TCP/IP Trace ABORT                                | DFSCTR0                                  | All, DDM                      | CTB, CLB, CRB, SPQB, SPQBEXT, INP_CNTS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK                                               |
| CVCT     | VTAM TRACE/ ABORT. <a href="#">"1" on page 281</a>    | DFSCVCT0                                 | ALL, DDM                      | CTB, CLB, CNT, CRB, IOBUF, CTT, INPCNTS, EMHB <a href="#">"2" on page 281</a>                                             |
| CVCV     | XRF class 2 takeover. <a href="#">"1" on page 281</a> | DFSCVCV0                                 | Always                        | CLB, CTB, CTT, LLB, LTB, LXB, LU6WA, CNT, CRB, SPQB, CTC, MSNB, EMHB, IOBUF, DDM                                          |
| D01      | Write setup.                                          | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, QBUF, S25                                                                                        |
| D02      | Write interrupt. <a href="#">"1" on page 281</a>      | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | IOB, CTB, CLB, CRB, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                                      |
| D03      | Read setup.                                           | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT, CRB                                                                                                        |
| D04      | Read interrupt. <a href="#">"1" on page 281</a>       | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | IOB, CTB, CLB, CRB, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                                      |
| D05      | Cleanup.                                              | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | IOB, CTB, CLB, CNT, CXB, CRB, CIB, CCB, MFS, QBUF, IOBUF, SALL, EMHB <a href="#">"2" on page 281</a>                      |
| D07      | LOGON. <a href="#">"1" on page 281</a>                | DFSICIO0 <a href="#">"9" on page 282</a> | ALL, DDM                      | CTB, CLB, CNT, CRB                                                                                                        |
| DD6M     | Output build (MFS).                                   | DFSCOFC0                                 | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, SEG, MFS, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                       |
| DD6S     | Output build (Non-MFS).                               | DFSCOFC0                                 | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                                 |
| DD8      | Prepare for output.                                   | DFSCOFC0                                 | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                                 |
| DDM1     | Write set up through COFC.                            | DFSCOFC0                                 | ALL, DDM                      | CTB, CLB, CNT, CRB, CIB, MFS, IOBUF, S25, EMHB <a href="#">"2" on page 281</a>                                            |

Table 62. DC trace records (continued)

| Trace ID             | Function                                                                                                | Traced by                | When traced or / TRACE option | What is traced                                                          |
|----------------------|---------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|-------------------------------------------------------------------------|
| FERR                 | MFS block fetch error. "3" on page 281                                                                  | DFSCFE00                 | Always                        | CIB, CTT, MFSBPCA, MFSTRACE "4" on page 281                             |
| FES1                 | Entry to front end switch user exit.                                                                    | DFSICIO0 "9" on page 282 |                               | CTB, CLB, CNT, QBUF, S25                                                |
| FES2                 | Exit from front end switch user exit.                                                                   | DFSICIO0 "9" on page 282 |                               | CTB, CLB, CNT, QBUF, S25                                                |
| FEXT "5" on page 282 | Before field edit exit.                                                                                 | DFSCFEI0                 | MFS                           | CTB, CIB                                                                |
| FMT1                 | Return from DFSFEIO or unformatted input.                                                               | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CLB, CIB, IOBUF, EMHB "2" on page 281                              |
| FMT2                 | MFS go to DFSFEIO formatted input.                                                                      | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CLB, CIB, IOBUF, EMHB "2" on page 281                              |
| FMT3                 | MFS complete process MSG segment.                                                                       | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CLB, CIB, MFS, QBUF                                                |
| FMT4                 | Get next input.                                                                                         | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CLB, CIB                                                           |
| FMT6                 | Clean up resources.                                                                                     | DFSICIO0 "9" on page 282 | ALL, MFS                      | CTB, CLB, CIB                                                           |
| HCSW                 | XRF class 1 takeover. "1" on page 281                                                                   | DFSHCSW0                 | Always                        | IOBUF, CNT, CRB, CTT, CTB, CLB                                          |
| ICLR                 | Message router.                                                                                         | DFSICLR0                 | Always                        | CTB, CLB, CTT, PCB                                                      |
| INIT                 | Device-dependent module (DDM) for ISC TCP/IP that sends session initiation requests.                    | DFSC7E0                  | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IR4B                 | Device-dependent module (DDM) for ISC TCP/IP that reads input messages that use the CICS IPIC protocol. | DFSC4B0                  | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IR7A                 | Device-dependent module (DDM) for ISC TCP/IP that reads input messages that use the CICS IPIC protocol. | DFSC7A0                  | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |

Table 62. DC trace records (continued)

| Trace ID | Function                                                                                                   | Traced by | When traced or / TRACE option | What is traced                                                          |
|----------|------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|-------------------------------------------------------------------------|
| IR8B     | Device-dependent module (DDM) for ISC TCP/IP that reads input messages that use the CICS IPIC protocol.    | DFSC8B0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IW1B     | Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.. | DFSC1B0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IW3B     | Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.  | DFSC3B0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IW6A     | Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.  | DFSC6A0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IW7A     | Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.  | DFSC7A0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| IW8A     | Device-dependent module (DDM) for ISC TCP/IP that builds output messages that use the CICS IPIC protocol.  | DFSC8A0   | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| MFSP     | MFS detected that protected data that is in the input is altered.                                          | DFSCFE10  | Always                        | CTB, CLB, CIB, MFS, IOBUF                                               |

Table 62. DC trace records (continued)

| Trace ID                             | Function                                                                                                  | Traced by                    | When traced or / TRACE option | What is traced                                                          |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|-------------------------------------------------------------------------|
| MSGS                                 | Device-dependent module (DDM) for ISC TCP/IP that sends messages that use the CICS IPIC protocol.         | DFSCT7E0                     | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| MTRP <a href="#">“8” on page 282</a> | Block verification error.                                                                                 | DFSCFE00                     |                               | CLB, CIB, MFS, CTT                                                      |
| MTRP <a href="#">“7” on page 282</a> | Block verification error.                                                                                 | DFSCFE10                     |                               | CLB, CIB, MFS, CTT                                                      |
| RESP                                 | Device-dependent module (DDM) for ISC TCP/IP that sends ACK/NAK messages that use the CICS IPIC protocol. | DFSCT7E0                     | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| SDC1                                 | Device-dependent module (DDM) SDC read error                                                              | DFSCIO20                     | ALL DDM                       | copy ctl blk list from CVCT entry                                       |
| SDC2                                 | Device-dependent module (DDM) SDC reread error                                                            | DFSICIO4                     | ALL DDM                       | copy ctl blk list from CVCT entry                                       |
| SEXT <a href="#">“6” on page 282</a> | Before segment edit exit.                                                                                 | DFSCFE10                     | MFS                           | CTB, CIB                                                                |
| TERM                                 | Device-dependent module (DDM) for ISC TCP/IP that sends session termination requests.                     | DFSCT7E0                     | All, DDM                      | CTB,CLB,CRB,SPQB, SPQBEXT,INP_CNDS, CTT, IOBUF, LU6WA, TCPWORK, CTBWORK |
| TRCE                                 | Non-SNA 3270 error.                                                                                       | DFSDN130, DFSDN140, DFSDS060 | Always                        | IOB, CTB, CLB, S25, CTT                                                 |
| VTPO                                 | Rejected posting of ECB.                                                                                  | DFSVTPO0                     | ALL, DDM                      | See notes <a href="#">“11” on page 282</a>                              |

**Notes:**

1. See [“Diagnosing line and terminal problems” on page 282](#) for more information on this trace code.
2. Fast Path EMHB buff traces (if present) with I/O buffers
3. Module return code saved in CLBTEMP4
4. Return codes from DFSFFRH0 (block fetch), MFSTRACE (when in MFSTEST) or MFSBPCA (when not in MFSTEST); MFSTRACE=MFSTEST trace parameters, MFSBPCA=MFS Buffer Pool Control Area:

**Offset in hex**

**0**

Current pool space in use

- 4** Maximum space used
- 5** Status flag
  - X'80' I/O active for a task
  - X'40' Task(s) queued for I/O
  - X'20' A task dequeued and posted

- 9** Error status
  - X'BB' BLDL error
  - X'FF' READ error

- A** Block name for BLDL error

- 10** BLDL return code on error

- 12** Sense from read error

- 14** CSW status from read error

- 16** Block name for read error

- 20** List for BLDL macro

5. Besides CIB and CTB:

**PARMLIST**  
Parameter list to be passed to EXIT

**FIELD**  
Field data before exit

6. Besides CIB and CTB:

**PARMLIST**  
Parameter list to be passed to EXIT

**SEGMENT**  
Segment data before exit

- 7. SEXT is logged if TRAP 1 is set by /TRACE and a buffer overwrite occurs.
- 8. MTRP is logged if TRAP 1 is set by /TRACE and a buffer overwrite occurs. In addition to the blocks, the DIF/DOF, MID/MOD, MFBP, and FRE are traced. If in output, R9 is also traced.
- 9. The MSNB control block content is traced by DFSICIO0 if the /DEQ LTERM, /DEQ NODE, or the /DEQ MSNAME command is entered with the PURGE or PURGE1 keywords.
- 10. The CRTU trace entry is mapped in [“Format of 6701 log record with CRTU identifier” on page 284.](#)
- 11. The VTPO trace entry is mapped in [“Format of the 6701 log record with VTPO identifier” on page 285.](#)

**Related tasks**

[“Printing the trace records” on page 273](#)

To format and print the trace records, use the File Select and Formatting Print utility (DFSERA10).

**Diagnosing line and terminal problems**

Use trace record identifiers to help in diagnosing line and terminal problems.

The trace records with the following identifier are useful in diagnosing line and terminal problems:



**A01**

TERMINAL INPUT READY FOR IMS PROCESSING

**I TP BUF**

Contains input device segment 6 to 36 bytes from the beginning of the buffer. The data is preceded by a 2-byte length and 2 bytes of zeros.

**A02**

PRIOR TO ISSUING VTAM I/O REQUEST. (LOGICAL READ)

**CLB**

For remote 3270:

**X'0001'**

Special poll (read sense/status)

**X'0401'**

Read initial (general poll)

**X'0082'**

Write initial

**X'0084'**

Write continue

Offset X'0C' contains the address in TP BUF to read into or write from.

**I TP BUF**

The input TP buffer contains data to be written if this is an output operation. For VTAM nodes, the RPL begins at offset X'08'.

**A05**

PRIOR TO ISSUING VTAM I/O REQUEST. (LOGICAL WRITE)

**CLB**

Refer to the information for record A02.

**O TP BUF**

The output TP buffer contains data to be written if this is an output operation. For VTAM nodes, the RPL begins at offset X'08'.

**A07**

GENERATE 'UNABLE TO RECEIVE/OUTPUT' MESSAGE

See the preceding D02 or D04 record for the cause.

**A09**

GENERATE ERROR MESSAGE

See the preceding D02, D04, or D07 record for the cause.

**AER2**

SHOULD NOT OCCUR ERROR HAS OCCURRED

**CLB**

Offset X'3E' contains the error message number in hexadecimal. All available control blocks and buffers are logged. This record is produced even if the trace is not set on.

**CRTU**

OUTPUT USER CREATION EXIT ROUTINE FAILURE

**CVCT**

VTAM DEVICE SUPPORT TRACE

**CLB**

Normally offset X'1C' contains the complemented IMS message key of an IMS master terminal message. All available control blocks and buffers are logged. This record is produced even if the trace is not set on.

**I TP BUF of O BUF**

The VTAM RPL begins at offset X'08'.

**CVCV**

XRF CLASS 2 TAKEOVER TRACE

This log record is written for XRF class 2 terminals during takeover, even though DC trace is not active on the terminal. This record can be used to diagnose subsequent session failures when used in conjunction with CVCT records.

**D02**

VTAM HAS POSTED I/O COMPLETE. (LOGICAL WRITE INTERRUPT)

**CLB****Offset X'00' =**

Post code

- X'40' for VTAM = normal completion

Other key fields are DECFLAGS and DECERRST. For VTAM, key fields are CLBFLAG and CLBLOST.

**O TP BUF**

For VTAM nodes, the VTAM RPL begins at offset X'08'.

**D04**

VTAM HAS POSTED I/O COMPLETE. (LOGICAL READ INTERRUPT)

**CLB**

Refer to the information for record D02.

**IOB**

Refer to the information for record D02.

**I TP BUF**

The input TP buffer contains data read from the terminal if the last operation was a read or poll. For VTAM nodes, the RPL begins at offset X'08'.

**D07**

DEVICE DEPENDENT INITIALIZATION/TERMINATION

**CLB**

Refer to information for record D02.

**O TP BUF**

The VTAM RPL begins at offset X'08'.

**HCSW**

XRF CLASS 1 TAKEOVER TRACE

This log record is written for XRF class 1 terminals during takeover, even though DC trace is not active on the terminal. This record can be used to diagnose subsequent session failures when used in conjunction with CVCT records.

**VTP0**

REJECTED POSTING OF ECB

**Format of 6701 log record with CRTU identifier**

A map of the formatted CRTU log record, including offset, hex code, and a description is shown.

Table 63. Map of formatted CRTU log record

| Offset | Hex code | Description                      |
|--------|----------|----------------------------------|
| +0     | H        | Length of buffer                 |
| +2     | XL5      | Internal use                     |
| +7     | X        | DFSCRTU0 return code (see below) |

Table 63. Map of formatted CRTU log record (continued)

| Offset | Hex code | Description      |
|--------|----------|------------------|
| +8     | XL68     | Internal use     |
| +4C    | CL8      | Input Lterm name |
| +54    | XL52     | Internal use     |

#### DFSCRTU0 return codes (decimal)

The DFSCRTU0 return codes and their meanings are listed.

```

4  'ENVIRONMENT' INCORRECT (for example, NO ETO,
   NO DFSINSX0 WITH SHARED QUEUES).
16  DUPLICATE LTERM/SMB NAME.
20  NO USER DESCRIPTOR COULD BE LOCATED
   FOR USE IN CREATING USER STRUCTURE.
24  INVALID INPUT LTERM NAME.
28  DFSINSX0 REJECTED USER-CREATION REQUEST.
32  STORAGE COULD NOT BE OBTAINED TO CREATE
   USER STRUCTURE.
36  STATIC USER ALREADY EXISTS.
40  INSERT EXIT PRAMETER ERROR: INVALID LTERM
   NAME, BAD FORMAT.
48  AVAILABLE.
52  LATCHING ERROR OCCURRED.
56  STORAGE MANAGER ERROR - DFSPPOOL.
60  ERROR IN ADDING DYNAMIC SMB TO HASH TABLE.
64  INSERT EXIT (DFSINSX0) PARAMETER ERROR:
   INVALID DYNAMIC TRANSACTION DATA.
68  LOCAL CNT FOUND, BUT DESTINATION REGISTERED
   TO RESOURCE MANAGER AS A TRANSACTION.
72  LOCAL SMB FOUND, BUT DESTINATION REGISTERED
   TO RESOURCE MANAGER AS AN LTERM.
76  DESTINATION REGISTERED TO RESOURCE MANAGER AS
   A CPIC TRANSACTION, APPC DESCRIPTOR, OR MSNAME.
80  DESTINATION COULD NOT BE VALIDATED IN RESOURCE
   MANAGER DUE TO AN RM INTERFACE ERROR.
84  SMB CREATION REQUESTED, BUT DESTINATION WAS ALREADY
   REGISTERED TO RESOURCE MANAGER AS AN LTERM, CPIC
   TRANSACTION, APPC DESCRIPTOR, OR MSNAME.
88  SMB CREATION REQUESTED, BUT SHARED QUEUES IS NOT
   ACTIVE.

```

#### Format of the 6701 log record with VTPO identifier

If an APPC or OTMA message is discarded because of a send type error, IMS does not log a type 6701–CMEA/CMEB record for the error.

The lack of type 6701–CMEA/CMEB records makes debugging for the Message Control/Error exit routine (DFSCMUX0) difficult. It does log type 6701–CMEA/CMEB records for errors related to other devices, however. The following table shows the VTCB posting in DFSVTPO0.

Table 64. VTCB posting in DFSVTPO0

| Offset | Hex code | Description                  |
|--------|----------|------------------------------|
| +0     | X        | Function code                |
|        | X'00'    | VTCB is to be posted         |
|        | X'04'    | VTCB is to be released       |
|        | X'08'    | Check if ACB can be closed   |
|        | X'0C'    | Delete a VTCB                |
|        | X'10'    | Stacked logon for static CLB |
|        | X'14'    | NSEXIT for static CLB        |
|        | X'18'    | NSEXIT for dynamic CLB       |
|        | X'1C'    | LOSTERM for static CLB       |
|        | X'20'    | LOSTERM for dynamic CLB      |

Table 64. VTCB posting in DFSVTPO0 (continued)

| Offset | Hex code                           | Description                                                                     |
|--------|------------------------------------|---------------------------------------------------------------------------------|
| +1     | X                                  | Type of checking RQD for post                                                   |
|        | X'04'                              | Post if node is active                                                          |
|        | X'08'                              | Post if node not active                                                         |
|        | X'0C'                              | Post if idle and not active                                                     |
|        | X'10'                              | Hard post the node                                                              |
|        | X'14'                              | Post an MSC LLB                                                                 |
| +2     | X                                  | Conditional data for posting                                                    |
|        | X'80'                              | Type is ISC parallel session                                                    |
|        | X'40'                              | Type is MSC LLB                                                                 |
|        | X'20'                              | Z-NET cancel in progress                                                        |
|        |                                    | On detection of an error, this byte contains one of the following reject codes: |
|        | X'01'                              | VTCB not specified                                                              |
|        | X'02'                              | Inspection failed—check subcode                                                 |
|        | X'03'                              | Node not idle                                                                   |
|        | X'04'                              | RQR failed—check subcode                                                        |
|        | X'05'                              | Node active—check subcode                                                       |
|        | X'06'                              | Node not alive—check subcode                                                    |
|        | X'07'                              | Invalid request                                                                 |
|        | X'08'                              | MSC link already posted                                                         |
|        | X'09'                              | MSC send outstanding                                                            |
|        | X'0A'                              | Node already dispatched                                                         |
|        | X'20'                              | No VTCB to delete                                                               |
|        | X'30'                              | CINIT rejected by PLU (NSX)                                                     |
|        | X'31'                              | VTAM error (NSX)                                                                |
|        | X'40'                              | Stacked logon procedure failure                                                 |
|        | +3                                 | X                                                                               |
| X'01'  |                                    | Node already dispatched (RQR)                                                   |
| X'02'  |                                    | Node already posted (RQR)                                                       |
| X'03'  |                                    | Unpostable I/O (RQR)                                                            |
| X'04'  |                                    | Clear issued (RQR)                                                              |
| X'05'  |                                    | Inact performed (RQR)                                                           |
| X'01'  |                                    | SPQB not found (INSPECT)                                                        |
| X'02'  |                                    | No match on CLB ADDR (INSPECT)                                                  |
| X'03'  |                                    | VOPEN not on (INSPECT)                                                          |
| X'04'  |                                    | VTCB not found by scan (INSPECT)                                                |
| X'05'  |                                    | No match on VTCBs (INSPECT)                                                     |
| X'06'  |                                    | CIDs do not match (INSPECT)                                                     |
| X'07'  |                                    | VOPEN not set (INSPECT)                                                         |
| X'08'  |                                    | Temporary VTCB (INSPECT)                                                        |
| X'01'  |                                    | No /idle node CMD (POSTRTN)                                                     |
| X'02'  |                                    | Node inoperable (POSTRTN)                                                       |
| X'03'  |                                    | Node dispatched (POSTRTN)                                                       |
| X'04'  |                                    | Line already posted (POSTRTN)                                                   |
| X'05'  |                                    | V2SND is set (POSTRTN)                                                          |
| X'06'  |                                    | Not XRF sync mode (POSTRTN)                                                     |
| X'07'  | Not SCIP exit with clear (POSTRTN) |                                                                                 |
| X'08'  | SCIP exit bindrace done (POSTRTN)  |                                                                                 |
| +4     | 0F                                 | Post code                                                                       |

Table 64. VTCB posting in DFSVTPO0 (continued)

| Offset | Hex code            | Description                            |
|--------|---------------------|----------------------------------------|
| +4     | X<br>X'80'<br>X'40' | NSEXIT flag<br>Cleanup RU<br>Notify RU |
| +5     | X                   | NSEXIT type for CLBLOST                |
| +6     | X                   | Reason code for CTBRTERM               |
| +7     | X                   | Notify reason code                     |
| +8     | F                   | VTCB address                           |
| +C     | CL8                 | VTAM node name                         |
| +14    | F                   | CID                                    |
| +18    | CL8>                | SPQB name if parallel session          |
| +20    | 0F                  | CLBNCID for a stacked logon            |
| +20    | F                   | Sense data (NSEXIT)                    |

**Note:**

1. This byte contains an additional qualifier subcode.

**Example of DC trace output**

An example of a Data Communication (DC) trace record is shown. This example shows part of a normal VTAM terminal logon flow.

```
INTERNAL TRACE RECORD          ID = D 07  SEGNO=00  RECNO = 0000013B  TIME 08.40.59.68  DATE 88.047
CLB
02248078 000000 40D6D7D5 00000000 00000000 00000000 00000000 00000000 00000000 00000000 *
OPN.....*
02248098 000020 00000000 00000000 C2F0D7F0 F6404040 00000100 022480FC 00000000 00000000
*.....B0P06.....*
022480B8 000040 00000000 00000000 00010000 00000000 022480FC 80000000 00000000 00000000
*.....*
022480D8 000060 00000000 00000000 00000000 00040000 00000000 00000000 40000000 00000000
*.....*
022480F8 000080 00000000
*.....*
CTB
022480FC 000000 00038CC8 02248078 00000000 000B2000 00000000 082A0000 0000FFFF 0003614C
*...H...../<*
0224811C 000020 00000000 00000000 022481C4 00004040 40404040 40400000 00000000 00000000
*.....AD.....*
0224813C 000040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0224815C 000060 SAME AS ABOVE
INP CNTS
0003614C 000000 00000000 00000000 00000000 00000000 00000000 00820084 00000000 C2F0D7F0
*.....B.D.....B0P0*
0003616C 000020 F6404040 00000001 022480FC 000371F0 FFFF0909 00000000 00000000
*6.....0.....*
NEXT CNT
000371F0 000000 00000000 00000000 00000000 00000000 00000000 00820084 00000000 D4E3D6D4
*.....B.D.....MTOM*
00037210 000020 C1E2E340 00000001 022480FC 00000000 FFFF0909 00000000 00000000
*AST.....*
INTERNAL TRACE RECORD          ID = C 08  SEGNO=00  RECNO = 0000013C  TIME 08.40.59.84  DATE 88.047
CLB
```

```

02248078 000000 40D6D7D5 00000000 00000000 00000000 00000000 00000000 00000000 00000000 *
OPN.....*
02248098 000020 00000000 00000000 C2F0D7F0 F6404040 00000100 022480FC 00000000 00000000
*.BOP06.....*
022480B8 000040 00000000 00000000 00010000 00000000 022480FC 80000000 00000000 00000000
*.....*
022480D8 000060 00000000 00000000 00000000 00040000 00000000 00000000 40000000 00000000
*.....*
022480F8 000080 00000000
*.....*
CTB
022480FC 000000 00038CC8 02248078 00000000 000B2000 00000000 082A0000 0000FFFF 0003614C
*..H...../*
0224811C 000020 00000000 00000000 022481C4 00004040 40404040 40400000 00000000 00000000
*.AD.....*
0224813C 000040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0224815C 000060 SAME AS ABOVE
CIB
022481C4 000000 40404040 40404040 00000000 00004040 40404040 00000000 00000000 00000000
*.....*
022481E4 000020 00000000 02C70000 00000000 00000000 00004040 40404040 40400000 40404040
*.G.....*
02248204 000040 40404040 00004040 40404040 00000000 00000000 00180050 00000000 00000000
*.....*
02248224 000060 40404040 40404040
*.....*
INTERNAL TRACE RECORD ID = A 05 SEGNO=00 RECNO = 0000013D TIME 08.40.59.86 DATE 88.047
CLB
02248078 000000 00000000 00000000 00000000 02235008 00000000 00000000 00000000 00000000
*.....&;.....*
02248098 000020 00000000 00000000 C2F0D7F0 F6404040 10000100 022480FC 00000000 00000000
*.BOP06.....*
022480B8 000040 01C80000 00000000 00010000 00000000 022480FC 80000000 00000000 00000000
*.H.....*
022480D8 000060 00000000 02235000 00000000 00000000 00000000 00000000 40000000 00000000
*.....&;.....*
022480F8 000080 00000000
*.....*
CTB
022480FC 000000 00038CC8 02248078 00000000 000B2000 00000000 082A0000 0000FFFF 0003614C
*..H...../*
DFSERA30 - FORMATTED LOG
PRINT PAGE 009
0224811C 000020 00000000 00000000 022481C4 00004040 40404040 40400000 00000000 00000000
*.AD.....*
0224813C 000040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0224815C 000060 SAME AS ABOVE
O TP BUF
02235000 000000 01C80088 00000000 00201670 00000000 00000000 00000000 00001000 00800000
*.H.H.....*
02235020 000020 0002FD14 00000000 00000000 02235088 20800000 00000000 00000000 00000000
*.....&H.....*
02235040 000040 10308050 00000000 80800000 44000000 00000000 00000000 00000000 00000000
*.....&;.....*
02235060 000060 00000000 00000000 80008010 00000000 00000000 00000000 00000000 00000000
*.....*
02235080 000080 00000000 00440000 D0000040 00000000 02248078 C2F0D7F0 F6404040 D9C5C3D6
*.BOP06 RECO*
022350A0 0000A0 D9C44040 00000000 00000000 41080002 00000001 00000000 00000000 00000000
*RD.....*
022350C0 0000C0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
022350E0 0000E0 TO 02235160 000160 SAME AS ABOVE
02235180 000180 00000000 00000000 00000000 00000000 FF00403F C181AA55 01900000 00000000
*.....AA.....*
022351A0 0001A0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....&;.....*
022351C0 0001C0 00000000 00000000
*.....*
INTERNAL TRACE RECORD ID = D 07 SEGNO=00 RECNO = 0000013E TIME 08.41.00.43 DATE 88.047
CLB
02248078 000000 40000000 00000000 00000000 02235008 00000000 00000000 00000000 00000000
*.....&;.....*
02248098 000020 00000000 00000000 C2F0D7F0 F6404040 10020100 022480FC 00000000 00050007
*.BOP06.....*
022480B8 000040 0840598F 0088047F 00010000 00000000 022480FC 80000000 00000000 00000000
*..H.....*
022480D8 000060 00000000 02235000 00000000 00000000 00000000 00000000 40000000 00000000
*.....&;.....*
022480F8 000080 00000000
*.....*
CTB
022480FC 000000 00038CC8 02248078 00000000 000B2000 00000000 082A0000 0000FFFF 0003614C
*..H...../*
0224811C 000020 00000000 00000000 022481C4 00004040 40404040 40400000 00000000 00000000
*.AD.....*
0224813C 000040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0224815C 000060 SAME AS ABOVE

```

```

INP CNTS
0003614C 000000 00000000 00000000 00000000 00000000 00820084 00000000 C2F0D7F0
*.....B.D....B0P0*
0003616C 000020 F6404040 00000001 022480FC 000371F0 FFFF0909 00000000 00000000
*6.....0.....*
NEXT CNT
000371F0 000000 00000000 00000000 00000000 00000000 00820084 00000000 D4E3D6D4
*.....B.D....MTOM*
00037210 000020 C1E2E340 00000001 022480FC 00000000 FFFF0909 00000000 00000000
*AST.....*
```

## Diagnosing problems in the Queue Control Facility Message Requeuer

The Queue Control Facility Message Requeuer (MRQ) processor module (DFSQMRQ0), which is part of the IMS Transaction Manager, provides diagnostic information for diagnosing errors while running the IBM IMS Queue Control Facility for z/OS (QCF).

Although problems can be diagnosed separately in the QCF product by using SCRAPLOG records and in the Queue Control Facility processor module by using 6701-MRQE diagnostic records, QCF and the Queue Control Facility processor work together to allow inserting and loading, querying, recovering, deleting and unloading, recovering, and viewing messages on the IMS message queue data sets and shared message queue structures.

In this topic, the information about SCRAPLOG records also applies to SCRAPSEL and SCRAPCAN records. The SCRAPSEL, SCRAPCAN, and SCRAPLOG data sets are generated by the IQCSELECT, IQCCANCL, and IQCINSRT modules of QCF, respectively, and are identical in both format and function.

- QCF functions help you accomplish the following tasks:
  - Message queue recovery when you want to return messages to the IMS queue for reprocessing.
  - Application recovery when you want to return messages to the IMS queue for reprocessing.
  - IMS queue maintenance (you can query, browse, unload, and load IMS nonshared queue environments).
  - Message queue migration and fallback.
  - Stress, regression, and application testing when transaction data is needed to simulate production loads or application input.
- A queue overflow protection function monitors queue usage and takes action to prevent queue utilization from reaching critical thresholds (non-shared queues environment).
- An ISPF front-end enables you to select QCF functions and selection criteria to complete the following tasks:
  - Query messages (or IMS status) on the queue
  - Unload (delete) messages from the queue
  - Load messages onto the IMS message queues
  - Release or terminate waiting tasks (nonshared queue environment)
  - Maintain the tables associated with queue overflow protection (nonshared queue environment)

### IBM IMS Queue Control Facility for z/OS interface

You can invoke the IBM IMS Queue Control Facility for z/OS functions through either a user control card input or a TSO/ISPF interface. The functions are Browse, Query, Load/Insert, Queue Overflow Protection, Recover, and Unload.

The following figure describes the IMS Queue Control Facility interface to IMS.

# QCF V2.1

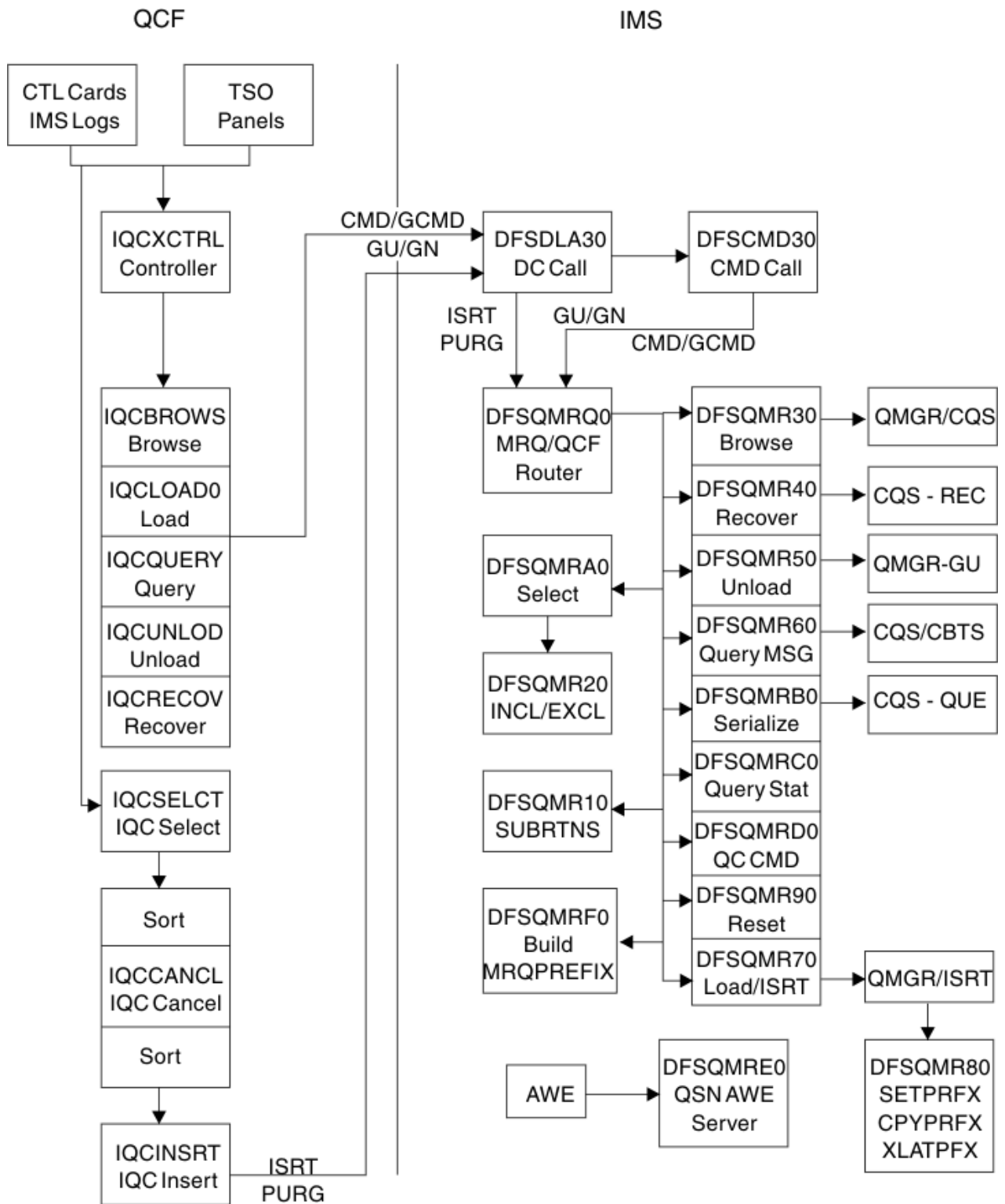


Figure 67. IMS Queue Control Facility interface to IMS

The functions are processed by function routines within IMS Queue Control Facility, and passed to corresponding function routines in IMS through a BMP application program interface (API). GCMD calls are used to invoke the function, and the messages, query, and status data is exchanged through GCMD, ISRT/PURGE, and GU/GN calls.



The IMS Queue Control Facility function routines interface with the IMS Queue Manager and Common Queue Server (CQS) routines.

By using the standard AIB interface, errors detected are recorded with an AIB return code = 000000F0, a unique AIBREASN code for each error, a TPCBSTAT code of MR, and a 6701-MRQE log record is written to the IMS online log data set (OLDS). The AIBREASN codes are printed in the reports (Browse, Query, Load, Recover, and Unload) and are documented in the DFSMRAEQ macro.

After the error is reported and logged, IMS Queue Control Facility and IMS skip to the next message, function, or terminate the BMP, depending on the error. The IMS Queue Control Facility routines in IMS do not abend. To diagnose the error, the 6701-MRQE log records should be printed and analyzed. The API calls may also be traced by IMS Queue Control Facility (Trace control card), or within IMS by issuing the /TRACE SET ON PROGRAM MRQPSB. The IMS Queue Control Facility trace sends output to the QCFPRINT DD data set. The IMS trace logs type 6701 records to the OLDS.

**Related reference**

“6701-MRQE diagnostic records” on page 293

An IMS error detected while QCF is requeuing messages results in the logging of a 6701-MRQE diagnostic record.

**SCRAPLOG diagnostic records**

By analyzing SCRAPLOG records, you can sometimes determine that a logical terminal (LTERM) to which messages are to be requeued does not exist. In this case, you can fix the problem and run the job again so that the messages are requeued.

As part of diagnosing problems with the Queue Control Facility/Message Requeuer, you use SCRAPLOG records. The SCRAPLOG record consists of a X'100' or X'140' MRQ prefix that is mapped by DFSMRQPF, followed by the actual message that is being inserted. The message is either a 4002 record (a message from a DUMPQ or SNAPQ checkpoint) or a 01 (input) or 03 (output) message record. IMS messages are mapped by the QLOGMSGP macro.

**Sample QCF record from scraplog data set**

An example showing a message that is scrapped by QCF and written to the SCRAPLOG data set is shown.

The first X'140' byte is the QCF prefix, mapped by the DFSMRQPF macro. Offset X'88' into DFSMRQPF is the AIBREASN code = 00001084 = message is nonrecoverable (in other words, INQUIRY=NORECOV on the IMS TRANSACT macro TRAN31B0).

The rest of the data is the message (offset 04 = X'03' = type 03 output message), mapped by macro QLOGMSGP.

**QCF prefix mapped by DFSMRQPF**

```

5B RECORD
QCF prefix mapped by DFSMRQPF
00000000 000000 04610000 5BD8C3C6 D4E2C700 08100102 01400000 00000000 00000000 00000000
*./.$QCFMSG.....*
00000020 000020 00000000 02000100 2001304F 22581647 4184032D E2E8E2F3 40404040 B6AB6C0E
*.....|.SYS3 .%.*
00000040 000040 26E03901 E2E8E2F3 40404040 B6AB6C0E 26E03901 00000000 00000000 00000000
*...SYS3 .%.*
00000060 000060 0001004C 00000000 08000002 40404040 40404040 E3D9C1D5 F3F1C2F0 D3F6F2D4 *...<.....
TRAN31B0L62M*
00000080 000080 E5E2F140 00000000 00000000 81000000 0000D4D9 000000F0 00001084 000A000A
*VS1 .....A....MR...0...D....*
000000A0 0000A0 E3D9C1D5 F3F1C2F0 40404040 40404040 00000000 00000000 D8C3C6E5 F1D9F240
*TRAN31B0 .....QCFV1R2 *
000000C0 0000C0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
000000E0 0000E0 TO 00000120 000120 SAME AS ABOVE
IMS message mapped by QLOGMSGP
00000140 000140 03110000 01D18194 08000002 08000002 02E40000 E2E8E2F3 40404040 B6AB6C0E
*....JAM.....U..SYS3 .%.*
00000160 000160 26E03901 E2E8E2F3 40404040 B6AB6C0E 26E03901 00000000 00000000 00000000
*....SYS3 .%.*
00000180 000180 00408100 C8000000 00000000 00000000 00010000 00000000 00000000 00000001 *.
A.H.....*
000001A0 0001A0 FFFFFFFF 0C027700 E3D9C1D5 F3F1C2F0 00000000 00000000 40404040 40404040
*....TRAN31B0.....*
000001C0 0001C0 00108600 0264FC00 00000000 00000000 011E8700 00C2D588 8000D600 C9D4E2D5
*..F.....G..BNH..O..IMSN*

```

```

000001E0 0001E0 C5E34040 D3F6F2D4 E5E2F140 D3F6F2D4 C4C5F0F1 40404040 40404040 00000000 *ET L62MVS1
L62MDE01
00000200 000200 00000000 0C027700 40404040 40404040 40404040 40404040 0C505A70 00000002
*.....*
00000220 000220 E3D9C1D5 F3F1C2F0 D3F6F2D4 E5E2F140 00000000 B6AB6C0E 24746405 00000000
*TRAN31B0L62MVS1 .....%.....*
00000240 000240 00000000 00000000 00000000 00000000 00000000 00000000 00000008 E3D9C1D5
*.....TRAN*
00000260 000260 F3F1C2F0 50018046 15519555 55555555 55555555 55555555 55555555 55555555
*31B0&.....N.....*
00000280 000280 55555555 55555555 55555555 55555555 55555555 86A3A781 B0B7A415 55555555
*.....FTXA..U.....*
000002A0 0002A0 55555555 09151515 15151515 15151515 15151515 00000000 00000000 00000000
*.....*
000002C0 0002C0 00000000 00E2E8E2 F3404040 40000000 00000000 00000000 00000000 00000000
*.....SYS3.....*
000002E0 0002E0 00000000 00000000 00000000 00000016 88004040 40404040 40404040 40404040
*.....H.....*
000002E0 0002E0 00000000 00000000 00000000 00000016 88004040 40404040 40404040 40404040
*.....H.....*
00000300 000300 4040D600 00108900 00018000 B6AB6C0E 26E49E81 00188A00 2001304F 22581647 *
0.....I.....%..U.A.....|.....*
00000320 000320 4184032D 00000000 00000000 00688B00 00000000 00000000 00000000 00000080
*.....D.....*
00000340 000340 00000000 00000000 00000000 00000000 00000000 00000000 0000000A 00000000
*.....*
00000360 000360 00000000 00000000 00000000 0000000A 000A000A E2E8E2F3 40404040 B6AB6C0E 26E03901
*.....SYS3.....%.....*
00000380 000380 00000000 00000000 00000000 00000000 00000000 00908C00 0000000A 00000000
*.....*
000003A0 0003A0 00000003 E3D9C1D5 F3F1C2F0 FDFDFDFD 0C027700 0A0A014C 40080000 00000000
*.....TRAN31B0.....<.....*
000003C0 0003C0 00000000 00000000 00000000 00000000 00000000 00000000 08100000 00000000
*.....*
000003E0 0003E0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
00000400 000400 00000000 00000810 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
00000420 000420 00000000 002D0300 E3D9C1D5 F3F1C2F0 40D6E4E3 C2D6E4D5 C440D4C5 E2E2C1C7 *.....TRAN31B0
OUTBOUND MESSAG*
00000440 000440 C540E3D6 40E3D9C1 D5F3F1C2 F0404040 40B6AB6C 0E26E5DF 01000000 00000001 *E TO
TRAN31B0 .....%..V.....*
00000460 000460 E5
*V *

```

### Key fields of SCRAPLOG records and their offsets

Key fields of SCRAPLOG records, including offset, label, length, value and a description will help you in diagnosing problems.

The following table shows key fields of the QCF records and their offsets.

*Table 65. Key fields in QCF records and their offsets*

| Offset | Label    | Length | Value    | Description                                                                  |
|--------|----------|--------|----------|------------------------------------------------------------------------------|
| 04     | MSGMRQID | 08     | \$QCFMSG | Prefix ID (First character is 5B, which causes DFSERA30 to print as 5B rec.) |
| 74     | MRPREDST | 08     | TRAN31B0 | Destination name                                                             |
| 94     | MRPRETRN | 04     | 000000F0 | AIBRETRN code, always this value for QCF errors                              |
| 98     | MRPREASN | 04     | 00001084 | AIBREASN code = message non recoverable                                      |

The following table shows the key fields in messages.

*Table 66. Key fields in messages (offset 0140=offset 00 into message)*

| Offset | Label    | Length | Value | Description                                                         |
|--------|----------|--------|-------|---------------------------------------------------------------------|
| 0140   | MSGLRLL  | 02     | 0361  | Length of message                                                   |
| 0144   | MSGLCODE | 01     | 01    | Log code, 01=input message, 03=output message                       |
| 0150   | MSGPRFLL | 02     |       | Length of total message prefix (user segments start at this offset) |

Table 66. Key fields in messages (offset 0140=offset 00 into message) (continued)

| Offset | Label    | Length | Value    | Description              |
|--------|----------|--------|----------|--------------------------|
| 01A8   | MSGODSTN | 08     | TRAN31B0 | Message destination name |

### Sample JCL for printing SCRAPLOG records

Use SCRAPLOG records in combination with 6701-MRQE records to effectively diagnose QCF problems.

The following figure shows sample JCL for printing SCRAPLOG records.

### Sample JCL for printing SCRAPLOG records

```
//SCRAPPRT JOB
//* PRINT IQCSELCT SCRAPSEL
//JOBLIB DD DISP=SHR,DSN=IMS610.RESLIB
//SELECT EXEC PGM=DFSERA10,REGION=512K
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=QCF.SCRAPSEL,DISP=SHR
//SYSIN DD *
CONTROL CNTL
OPTION PRINT E=DFSERA30
END
/*
//CANCEL EXEC PGM=DFSERA10,COND=EVEN,REGION=256K
//* PRINT IQCCANCL SCRAPCAN
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=QCF.SCRAPCAN,DISP=SHR
//SYSIN DD *
CONTROL CNTL
OPTION PRINT E=DFSERA30
END
//INSERT EXEC PGM=DFSERA10,COND=EVEN,REGION=256K
//* PRINT IQCINSRT SCRAPLOG
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=MRQ.SCRAPLOG,DISP=SHR
//SYSIN DD *
CONTROL CNTL
OPTION PRINT E=DFSERA30
END
/*
```

## 6701-MRQE diagnostic records

An IMS error detected while QCF is queuing messages results in the logging of a 6701-MRQE diagnostic record.

The message that is being queued is then discarded (and written to the SCRAPLOG), and the QCF BMP (IQCINSRT) proceeds to the next message. Each type of error is accompanied by a unique reason code that is set in the application interface block reason code field (AIBREASN).

When the IQCINSRT step completes, a report of messages scrapped and grouped by reason code is produced. A report of messages scrapped and grouped by destination name is also produced.

### Related reference

[“IBM IMS Queue Control Facility for z/OS interface” on page 289](#)

You can invoke the IBM IMS Queue Control Facility for z/OS functions through either a user control card input or a TSO/ISPF interface. The functions are Browse, Query, Load/Insert, Queue Overflow Protection, Recover, and Unload.

### Sample JCL for printing the 6701-MRQE diagnostic records

The following figure shows sample JCL for printing 6701-MRQE records.

### Sample JCL for printing 6701-MRQE records

```
//LOGPRNT JOB
//JOBLIB DD DISP=SHR,DSN=IMS610.RESLIB
//IMSLOG0 EXEC PGM=DFSERA10,REGION=512K
//SYSPRINT DD SYSOUT=A
```

```
//SYSUT1 DD DSN=IMS610.OLDSP0,DISP=SHR
//SYSIN DD *
CONTROL CNTL
OPTION PRINT 0=5,V=6701,L=2,C=M,E=DFSERA30
OPTION PRINT 0=9,V=MRQE,L=4,T=C,C=E,E=DFSERA30
END
/*
```

### Control blocks logged at time of error (and their mapping macros)

The following table shows the 6701-MRQE diagnostic record control blocks and data areas that are logged if they are available at the time of the error.

Table 67. Control blocks and data areas logged at time of error for 6701-MRQE records

| Block     | Description                                                                  | Mapping macro                                                                     |
|-----------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| AIB       | Application interface block<br>AIBRETRN, AIBREASN codes                      | DFSAIB<br>DFSMRAEQ                                                                |
| CMDMSGP   | Command call buffer for browse, load, QSN, query, recover, or unload command | DFSMRQCW (OCO)                                                                    |
| DFSSQQRY  | Query buffer                                                                 | CQSQRQT                                                                           |
| I/O AREA  | Input/Output area                                                            | QLOGMSGP                                                                          |
| MRQCMDWK  | Command call buffer for browse, load, QSN, query, recover, or unload command | DFSMRQCW (OCO)                                                                    |
| MRQPREFIX | QCF prefix buffer                                                            | DFSMRQPF                                                                          |
| MRQWORK   | MRQ/QCF work area                                                            | Mapping macro                                                                     |
| MRSELROW  | Include/Exclude work area                                                    | DFSMRQCT (OCO)                                                                    |
| MRSELWK   | Select work buffer                                                           | DFSMRQSW (OCO)                                                                    |
| PCB       | Program communication block                                                  | IDLI TPCBBASE=0,CALLER=IMS                                                        |
| PST/EOB   | Partition specification table / end of block                                 | IDLI PSTBASE=0                                                                    |
| PSTDCA    | DL/I call parameter area                                                     | No DSECT                                                                          |
| QMBA      | Queue manager buffer area                                                    | DFSQMGR FUNC=QDSECT                                                               |
| QSAPWKAD  | Queue manager work area                                                      | QSAPWKAD                                                                          |
| QTPDST    | Queue manager destination block                                              | ICLI CNTBASE=0, or IAPS SMBBASE=0 (CNT/LNB or SMB) DSECT for QAB/TIB not provided |
| REG14-12  | Registers 14 through 12                                                      | No DSECT                                                                          |
| WORKMSG   | Work message buffer                                                          | QLOGMSGP                                                                          |

### Normal errors and their AIBREASN codes

Some errors might be normal. It is important to determine the AIBREASN code, destination name, and other characteristics of the message to determine whether or not the error is normal.

For example, the following AIBREASN codes are considered normal:

**AIBREASN**  
**Explanation**

**00001080**

Message destination is an LU 6.2 synchronous logical unit (LU) name and as such is considered nonrecoverable.

**00001084**

Message destination is nonrecoverable either because the destination transaction code name was defined as NORECOV or the message was received from a LU 6.2 LU in synchronous conversation mode, which implies nonrecoverable.

**00001088**

Message was already canceled by IMS. Most likely the cause of this is an output message that was canceled when the application program abended or issued a ROLL or ROLB call.

**000010A4**

The message being passed by IQCINSRT is an internal IMS message that is not recoverable.

**00002014**

The message is being purged (enqueued to a temporary destination) and the temporary destination name of the message is an inquiry type LTERM.

**Abnormal errors that can be expected**

Some errors might be expected. It is important to determine the AIBREASN code, destination name, and other characteristics of the message to determine whether or not the error is expected.

For example, when a source or destination name is not found, an error might occur if the system was redefined and the resource name was deleted.

**Obtaining diagnostics in addition to SCRAPLOG and 6701-MRQE**

When the 6701-MRQE diagnostic records and the SCRAPLOG records do not provide enough diagnostic detail to adequately diagnose a problem, you can obtain additional diagnostic details by issuing the **/TRACE SET ON PROGRAM** command. **/TRACE SET ON *pgmname*** causes the logging of additional 6701-MRQB records when the QCF BMP is processing.

When the 6701-MRQE diagnostic records and the SCRAPLOG records do not provide enough diagnostic detail to adequately diagnose a problem, you can obtain additional diagnostic details by issuing the following command:

```
/TRACE SET ON PROGRAM pgmname
```

where *pgmname* is the name of the appropriate MRQPSB.

6701-MRQB diagnostic records are almost identical to 6701-MRQE records, with the exception of MRQB appearing where MRQE normally does. The *pgmname* value is the default QCF PSBNAME. This value might have been overridden on the MSGQUEUE MRQPSBN parameter at system definition. To determine if your installation has overridden the name, either consult with your IMS system administrator or issue the IMS command **/DISPLAY PROGRAM MRQPSB**.

If PROGRAM MRQPSB displays as an invalid name, your installation has overridden the default MRQPSB. Consult with your system administrator for the correct name for your installation.

The records that are contained in this program are in addition to the existing program trace records logged by DFSDLA30. Records logged by DFSDLA30 are types 6701-LA3A and 6701-LA3B, which contain the TPCB, I/O AREA (64 bytes), and PST control blocks.

With the program trace set on, for each ISRT call to insert a message (or segment of a message), there is an LA3A, MRQB, and LA3B record. For each PURG call (which completes and enqueues a message) there is one LA3A and LA3B log record. If an error is detected while processing either call, an additional MRQE record is logged. The MRQE records are logged regardless of whether the program trace is on when an error is detected.

**Related tasks**

[“IMS transaction trace” on page 307](#)

The IMS transaction trace writes entries to the IMS log at entry to and exit from the DC call analyzer (DFSDLA30).

## Determining when messages are successfully queued

Messages that are successfully queued by the Queue Control Facility/Message Requirer are logged to the OLDS with an identical 01 (input) or 03 (output) log record as the original, except when MSGCFLG3=MSGC3MRQ (that is, message+19=45) is set to indicate that this message was queued by the Queue Control Facility/Message Requirer.

This flag is propagated to other messages that originate from this message. (That is, if the message is an input transaction message the flag is propagated to the output response messages when the transaction message is processed. Or, if the message is an MSC message, it is propagated to messages in other IMS/MSK systems when the message is sent across the MSC link.)

The following figure shows an input transaction to TRANCODE=TRAN31V0 from LTERM=IMSUS02 that was queued by QCF.

### Sample log record showing successfully queued message

```

01
RECORD

00000000 000000 01EE0000 01C18110 08000055 08000055 01CE1000 E2E8E2F3 40404040 B6AB6CBC
*...AA.....SYS3 ..%.*
00000020 000020 C4E84B83 C9D4E2F1 40404040 B7BD992F E30E2241 80000100 00000000 00000000
*DY.CIMS1 ..R.T.....*
00000040 000040 00408100 C8400000 C4E3E2D3 E4F2F0F2 00020000 00000000 00000000 00000001 *
A.H ..DTSLU202.....*
00000060 000060 C9D4E2E4 E2F0F240 E3D9C1D5 F3F1E5F0 00000000 00000000 C4C6E2D4 D6F24040 *IMSUS02
TRAN31V0.....DFSM02 *
00000080 000080 00108600 014E7C00 00000000 00000000 00168800 C9D4E2E4 E2F0F240 40404040
*..F.+@.....H.IMSUS02 *
000000A0 0000A0 40404040 E4000018 89000000 0000B6AB 6CBCC4EA CD030000 00000000 00000018 *
U...I.....%D.....*
000000C0 0000C0 8A002001 304F2301 19573676 032D0000 80000000 00000068 8B000000 00000000
*...|.....*
000000E0 0000E0 00000000 00000000 00800000 00000000 00000000 00000000 00000000 00000000
*.....*
00000100 000100 00000000 000A0000 00000000 00000000 00000000 000A0024 000AE2E8 E2F34040
*.....SYS3 *
00000120 000120 4040B6AB 6CBCC4E8 4B830000 00000000 00000000 00000000 00000000 00000090
*...%DY.C.....*
00000140 000140 8C000000 000A0000 00000000 0003E3D9 C1D5F3F1 E5F0C9D4 E2E4E2F0 F240240A
*.....TRAN31V0IMSUS02 ..*
00000160 000160 014C0008 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.<.....*
00000180 000180 00000810 00000000 00000000 00000000 00000000 01E3D9C1 D5F3F1E5 F0404040
*.....TRAN31V0 *
000001A0 0001A0 40404040 00000000 00000000 00000000 08100000 00000000 00000000 00000000
*.....*
000001C0 0001C0 00000000 00000000 00000000 00000010 0301E3D9 C1D5F3F1 E5F040C8 C94BB7BD
*.....TRAN31V0 HI...*
000001E0 0001E0 992FE30F C9610000 00000000 021B
*R.T.I/.....*

```

## Diagnosing message routing problems

User exits are consolidated into user exit DFSMSCE0. Several traces, messages, and information fields in the message prefix area can be used to diagnose message routing problems in the user exits and in IMS.

### DFS070 UNABLE TO ROUTE MESSAGE RSN=xyxy

Message DFS070 is issued when any one of three conditions occur.

- IMS attempts to enqueue a message.
- These TM/MSK exits attempt to reroute a message:
  - DFSMSCE0–Message Routing.
  - DFSMSTR0–Terminal Routing.
- A **/FORMAT** command is entered and an error is encountered while routing a message.

## DFS070 diagnostic message

Diagnostic messages from DFS070 are described.

Here is an example of the DFS070 diagnostic message:

```
DFS070 UNABLE TO ROUTE MESSAGE RSN=0104
```

The RSN code identifies the module that issued the message (01 = DFSICIO0) and the reason for the error (04 = Prefix buffer length is too large).

In this case DFSICIO0 called the message generator (DFSCLMR0) with R1 = 00680046.

```
Where x'00680046' = module identifier, reason code,message key
                x'0068' = 0104 (decimal)
                    01 = Module that issued message = DFSICIO0
                    04 = Prefix buffer length is too large

                x'0046  = 70 (decimal) = DFS070 MESSAGE KEY
```

The following table shows:

- The label used for the module identifier
- The module identifier
- The module function or name

The labels shown in the following table can be used to scan the module source code to locate where the message was issued from.

*Table 68. DFS070 module identifier table*

| <b>Label</b> | <b>Default module identifier</b> | <b>Function (module name)</b>               |
|--------------|----------------------------------|---------------------------------------------|
| MSUK         | 00                               | Unknown module or DFSMSCEC requestor        |
| MSTR         | 01                               | DC Communication Manager (DFSICIO0)         |
| MSTRAP       | 02                               | LU 6.2 Receive LU Manager (DFSRLM10)        |
| MSTROT       | 03                               | OTMA Receive LU Manager (DFSYTIB0)          |
| MSPR         | 04                               | DC Call Handler (DFSDLA30)                  |
| MSLR         | 05                               | MSC Analyzer (DFSCMS00)                     |
| MSFM         | 06                               | <b>/FORMAT</b> Command Processor (DFSICLK0) |
| MSTE         | 08                               | IMS Termination (DFSTRM00)                  |
| MSINIT       | 10                               | IMS Initialization (DFSIIINB0)              |

The following table shows:

- The label used for the reason code
- The reason code value
- The description of the error

The labels shown in the following table can be used to scan the module source code to locate where the message was issued from.

Table 69. DFS070 reason (RSN) codes table

| Label    | Reason code decimal/hexadecimal | Description                                                                                                                                                                                                                                                                                                                                                                          |
|----------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PFXUPRER | 02/02                           | User requested 2 user prefix segments (code 8E).<br><br>Programmer response: The routine that was setting up to call the DFSMSCEO user exit determined that a user prefix segment had already been obtained. The programmer may need to turn on the DFSMSCEO trace to determine which routine is setting the field, MSCEUPR (DFSMSCEP) or the flag MSCEB2RET (DFSMSCEB).             |
| PFXIPRER | 03/03                           | User requested two Workload router prefix segments (code 8F).<br><br>Programmer response: The routine that was setting up to call the DFSMSCEO user exit determined that a user prefix segment had already been obtained. The programmer may need to turn on the DFSMSCEO trace to determine which routine is setting the field MSCEUPR (DFSMSCEP) or the flag MSCEB2RET (DFSMSCEB). |
| PFTOOBIG | 04/04                           | Prefix buffer length is too large.<br><br>Programmer response: The user prefix segment size field MSCEUPRL (DFSMSCEP) or the workload router prefix segment size field MSCEIPRL (DFSMSCEP) is greater than 512. The programmer may need to turn on the DFSMSCEO trace to determine which routine is setting the field MSCEUPR or MSCEIPR (DFSMSCEP) to a value larger than 512.      |
| GBPFER   | 05/05                           | DFSPPOOL error on get prefix buffer.<br><br>Programmer response: Failure to get storage for the user prefix segment or the workload router prefix segment through the DFSPPOOL macro from the HIOP pool.                                                                                                                                                                             |
| URCERR1  | 06/06                           | User exit return code negative.<br><br>Programmer response: User exit DFSMSCEO returned a negative return code.                                                                                                                                                                                                                                                                      |
| URCERR2  | 07/07                           | DFSBCB error getting BCB block.<br><br>Programmer response: User exit DFSMSCEO returned a negative return code returned an invalid return code.                                                                                                                                                                                                                                      |
| GMSBERR  | 08/08                           | DFSBCB error getting BCB block.<br><br>Programmer response: Failure to get storage for the MSEB block through the DFSBCB macro.                                                                                                                                                                                                                                                      |
| LRBADSID | 09/09                           | Bad SYSID detected.<br><br>Programmer response: In getting the address for the LNB that is associated with either the origin SID or the SID that is specified by the caller, a bad SYSID was detected.                                                                                                                                                                               |



Table 69. DFS070 reason (RSN) codes table (continued)

| Label    | Reason code decimal/hexadecimal | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPFX     | 10/0A                           | Queue Manager insert prefix error.<br><br>Programmer response: In an effort to update the MESSAGE PREFIX (01/03) log record, a prefix update call was made (DFSQMGR0) to add the user prefix segment or the workload router segment, or both. The prefix update routine was unable to add the segment.                                                                                                                                                                      |
| ICLR1ERR | 11/0B                           | Non zero return code from DFSICLR1 (DFSICLR0).                                                                                                                                                                                                                                                                                                                                                                                                                              |
| AVMLKERR | 12/0C                           | Destination is an invalid type for AVML/ISC link.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| MSCEFL1E | 15/0F                           | DFSMSCEC user exit routing flag is in error.<br><br>Programmer response: An invalid option was requested for the user routing exit flag 1 (MSTRFL1/MSLRFL1/MSPRFL1). Refer to the DFSMSCEP macro for valid options. Check the user exit parameter in the 6701-MSCE record to determine which option was requested. These options are usually set by IMS code.                                                                                                               |
| USRXIFER | 16/10                           | DFSUSRX interface error.<br><br>Programmer response: The macro DFSMSCEC invoking DFSUSRX0 through the DFSUSRX macro received a non-zero return code. The value is in field MSCEBRC in the DFSMSCEB block. Possible values returned are:<br><br>1. 04 the user exit routine specified has not been defined (the address in UXDT is zero)<br><br>2. Unable to get an interface block using the DFSBCB macro. DFSBCB return code is in field, MSCEBSSRC in the DFSMSCEB block. |
| IONAMCHG | 18/12                           | User exit changed the destination name of the I/O PCB message.<br><br>Programmer response: The user exit (DFSMSCE0) set flag MSPR2CHG in field MSPRFL2 to request that the destination name MSPRDEST be changed. The PCB is the I/O PCB that cannot be changed. Check the user exit parameter in the 6701-MSCE record to determine which option was requested.                                                                                                              |
| IOROUTE  | 19/13                           | User exit requested reroute I/O PCB message.<br><br>Programmer response: The user exit DFSMSCE0 requested a routing option of MSPR2RMT, /MSPR2LSQ, /MSPR2SRC, /MSPR2NDR in field MSPRFL2. This is invalid if the PCB is the I/O PCB.<br><br>Refer to the user exit parameter in the 6701-MSCE record to determine which command was requested.                                                                                                                              |
| CMDINV   | 20/14                           | User exit changed the destination name to a command (such as: / <b>CMDVERB</b> ).<br><br>Programmer response: The user exit DFSMSCE0 changed the destination name to a command.<br><br>Refer to the user exit parameter in the 6701-MSCE record to determine which command was requested.                                                                                                                                                                                   |

Table 69. DFS070 reason (RSN) codes table (continued)

| Label    | Reason code decimal/hexadecimal | Description                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQGINV   | 21/15                           | User Link receive exit override MSNAME in segment because destination is not an MSNAME.<br><br>Programmer response: User exit DFMSMCE0 in a shared queues group link receive exit failed due to the destination not being an MSNAME.                                                                                                                                                                                 |
| REGFAIL  | 22/16                           | Local shared queue registration (DFSSQIF FUNC=INFRM) failed for the transaction when the user exit requested MSLR2LSQ=1 or MSTR2LSQ=1.                                                                                                                                                                                                                                                                               |
| NOTRANCD | 23/17                           | Terminal routing exit routed the message to a remote IMS (MSTR2RMT=1) but the destination type at MSTRDEST is an unsupported TRANCODE (such as remote routing is not allowed for LTERM or FAST PATH exclusive TRANCODE).                                                                                                                                                                                             |
| DSIDINV  | 24/18                           | The Terminal, Link Receive or the Program Routing exit returned an invalid destination SYSID (for example, either field MSTRDSID, MSLRDSID, or MSPRDSID is invalid).                                                                                                                                                                                                                                                 |
| DMSNINV  | 25/19                           | The Terminal, Link Receive, or Program routing exit returned an invalid destination MSNAME (for example: either field, MSTRDMSN, MSLRDMSN, or MSPRDMSN is invalid).                                                                                                                                                                                                                                                  |
| SSIDINV  | 26/1A                           | The Link Receive exit rerouted an intermediate message (MSLR1INT=1) to this local IMS by setting MSLR2LOC=1, but the message had an invalid return (source) SYSID so this IMS could not accept it locally.                                                                                                                                                                                                           |
| RMT2INV  | 27/1B                           | The Terminal, Link Receive, or Program routing exit indicated routing the message to a remote MSC link by setting MSTR2RMT, MSLR2RMT, or MSPR2RMT; however, the exit did not set either of the corresponding destination SYSID or MSNAME fields (for example, either MSTRDSID, MSLRDSID, or MSPRDSID was left set to zero, or MSTRDMSN, MSLRDMSN, or MSPRDMSN was left set to blanks).                               |
| SRC2INV  | 28/1C                           | The Program routing exit requested the message be routed to the source MSC system by setting MSPR2SRC=1 however the message cannot be routed because either: <ul style="list-style-type: none"> <li>• MSC is not available.</li> <li>• Or the source SYSID is not valid because the application program has not issued a get unique (GU).</li> <li>• The application program is a non-message driven BMP.</li> </ul> |
| NDR2INV  | 29/1D                           | The Program Routing exit requested a direct routing message be overridden by setting MSPR2NDR=1; however, either: <ul style="list-style-type: none"> <li>• MSC is not available.</li> <li>• This is not a direct routed message with a MSNAME destination.</li> <li>• The overriding name in the front of the I/O area is not valid.</li> </ul>                                                                      |

Table 69. DFS070 reason (RSN) codes table (continued)

| Label    | Reason code decimal/hexadecimal | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RMT2FSR  | 30/1E                           | The Terminal routing exit indicated to route the message to a remote MSC link by setting MSTR2RMT=1, but the input ISC node was set to process the message as a Front End Switch message by the user Front End Switch exit (DFSFEBJ0). Front End Switch messages cannot be routed to MSC links.                                                                                                                                                                                                                                                                                        |
| RSPROUTE | 31/1F                           | The Link receive exit requested that a response message (MSLR1RSP=1) be rerouted by either setting one of the MSLRFL2 reroute flags. Response messages may not be rerouted.                                                                                                                                                                                                                                                                                                                                                                                                            |
| INBCHGID | 33/21                           | CHANGEID not supported.<br><br>Programmer response: The user exit (DFSMSCEO) did not use the DFSMSCSV macro or generate module entry code. IMS initialization expects a branch instruction around the character information of entry code.<br><br>Refer to the sample version of the provided user exit DFSMSCEO's use of DFSMSCSV for more information.                                                                                                                                                                                                                               |
| INBIDLNG | 35/23                           | Character string 'VECTOR' not present.<br><br>Programmer response: The user exit (DFSMSCEO) did not use the DFSMSCSV macro or generate module entry code. IMS initialization expects the entry code to contain a length of the module entry code at a given offset.<br><br>Refer to the sample version of the provided user exit DFSMSCEO's use of DFSMSCSV for more information.                                                                                                                                                                                                      |
| INBNVECT | 35/23                           | Character string 'VECTOR' not present.<br><br>Programmer response: The user exit DFSMSCEO did not use the DFSMSCSV macro or module entry code to provide the character string "VECTOR" in its entry code.<br><br>Refer to the sample version of the user exit DFSMSCEO's use of DFSMSCSV for more information.                                                                                                                                                                                                                                                                         |
| PFXUINVA | 36/24                           | Upon return from the user exit IMS detected that the user prefix at MSCEUPR is invalid.<br><br>Possible causes are: <ul style="list-style-type: none"> <li>• Length not in range of 5 to 512 bytes.</li> <li>• Address of prefix is invalid. Must be address obtained by IMS or within HIOP pool.</li> <li>• Length has been changed (MSCEBUPRL).</li> <li>• Address of user exit prefix has changed (MSCEBUPR).</li> <li>• Prefix code not 8E.</li> </ul> The programmer may need to turn on the DFSMSCEO trace to trace the fields MSCEBUPR and MSCEBUPRL within the DFSMSCEB block. |

Table 69. DFS070 reason (RSN) codes table (continued)

| Label    | Reason code decimal/hexadecimal | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PFXIINVA | 37/25                           | <p>Upon return from the user exit, IMS detected the Workload Router prefix at MSCEIPR is invalid.</p> <p>Programmer response:</p> <ul style="list-style-type: none"> <li>• Length not in range of 5 to 512 bytes.</li> <li>• Address of prefix is invalid. Must be address obtained by IMS or within HIOP pool.</li> <li>• Length has been changed (MSCEBIPRL).</li> <li>• Address of workload router prefix has changed (MSCEBIPR).</li> <li>• Prefix code is not 8F.</li> </ul> <p>The programmer may need to turn on the DFSMSCE0 trace to trace the fields MSCEBIPR and MSCEBIPRL within the DFSMSCEB block.</p> |
| EXIOVLAY | 38/26                           | <p>User exit overlaid the 512 byte user work area buffer.</p> <p>Programmer response: The user exit DFSMSCE0 appears to have overlaid the 512 byte workarea.</p> <p>The overlay character string SCDSMCON is inserted at the end of the 512 byte workarea M5EBIBOV before calling the user exit DFSMSCE0 and is checked on return.</p> <p>Refer to the user exit DFSMSCEB in the 6701-MSCE record to help determine the overlay.</p>                                                                                                                                                                                 |
| EXBOVLAY | 39/27                           | <p>User exit overlaid the M5EB BCB block name (Overlay Check).</p> <p>Programmer response: The user exit (DFSMSCE0) appears to have overlaid the DFSMSCEB block. The DFSBCB system service inserts a character string (M5EB) at the end of the DFSMSCEB block. IMS will abend when the DFSMSCEB block is returned by way of a DFSBCB release request. The DFS070 message will assist in determining when the overlay occurred.</p> <p>Refer to the user exit parameter in the 6701-MSCE record to help determine the overlay.</p>                                                                                    |
| EXPOVLAY | 40/28                           | <p>User exit overlaid the parameter list (Overlay Check).</p> <p>Programmer response: The user exit DFSMSCE0 appears to have overlaid the user exit parameter list (DFSMSCEP). The overlay character string SCDSMCON is inserted at the end of the parameter list DFSMSCEP before calling the user exit DFSMSCE0 and is checked on return.</p> <p>Refer to the user exit parameter in the 6701-MSCE record to help determine the overlay.</p>                                                                                                                                                                        |

Codes 41 thru 52, shown in the following table, apply to the **/FORMAT** command.

Table 70. DFS070 reason (RSN) codes table for the /FORMAT command

| Label    | Reason code decimal/hexadecimal | Description                                                                                   |
|----------|---------------------------------|-----------------------------------------------------------------------------------------------|
| FMFND    | 41/29                           | The CNT for the terminal to be formatted was not found.                                       |
| FMRCNT   | 42/2A                           | The specified terminal is a remote LTERM.                                                     |
| FMDLNB   | 43/2B                           | The specified terminal is a dynamic MSNAME (LNB).                                             |
| FMMFST   | 44/2C                           | The destination terminal (different from the input terminal) is not MFS-formatted.            |
| FMLRESMD | 45/2D                           | The destination terminal is in line response mode.                                            |
| FMTRESMD | 46/2E                           | The destination terminal is in terminal response mode.                                        |
| FMCONV   | 47/2F                           | Conversation is active on the destination terminal (when LTERM was specified in the command). |
| FMINP    | 48/30                           | The terminal is in input mode only.                                                           |
| FMEACL   | 49/31                           | The terminal was in exclusive mode (when LTERM was specified in the command).                 |
| FMQBUF   | 50/32                           | The call to Queue Manager failed for a <b>PUT LOCATE</b> call.                                |
| FMIPREF  | 51/33                           | The <b>INSERT PREFIX</b> call to Queue Manager failed.                                        |
| FMMSGNR  | 52/34                           | The call to enqueue the message failed.                                                       |

### DFSMSCEO TM/MSC Message Routing exit trace

The DFSMSCEO TM/MSC Message Routing exit trace can be activated individually for each exit entry point that processes a message routing request. This trace is useful for diagnosing problems in both the user exit and in IMS.

The DFSMSCEO TM/MSC Message Routing Exit trace writes a 6701-MSEA log record when the exit is entered, and a 6701-MSEB log record when the exit returns to IMS to process the reroute request. The following information is traced:

- Exit parameter area, DFSMSCEP
- 512 byte work area
- Message
- Message prefix
- Message segment being inserted
- Other work area storage

#### Displaying DFSMSCEO trace status

Use the **/DISPLAY TRACE EXIT** command to display the DFSMSCEO trace status.

To display the DFSMSCEO trace status, issue the following command:

```
/DISPLAY TRACE EXIT
```

The display will show ON, OFF, or N/A for each DFSMSCEO trace entry point.

## Starting and stopping the DFSMSCEO trace

To start or stop the DFSMSCEO trace, issue one of the **/TRACE** commands.

```
/TRACE SET (ON|OFF) EXIT (DFSMSCEO) (ALL|TRBT|TRVT|TR62|
TROT|LRTR|LRLT|LRIN|
LRDI|PRCH|PRIS)
```

Any combination of TRBT, TRVT, TR62, TROT, LRTR, LRLT, LRIN, LRDI, PRCH, and PRIS is valid.

### DFS081 trace exit command unsuccessful RSN=xyxy message

Message DFS081 is issued for a variety of reasons. The module identifier and function name are listed as well as the reason codes and descriptions.

This message is issued when one or more of the following scenarios occurs:

- IMS attempts to enqueue a message.
- The following user exits attempt to reroute a message:
  - The TM/MSC message routing exit, DFSMSCEO.
  - The Terminal Routing exit, DFSMSTRO.
- A **/FORMAT** command was entered.
- An error was encountered while routing the message.

Table 71. DFS081 module identifier table

| Label | Module identifier<br>(decimal) | Function (module name)             |
|-------|--------------------------------|------------------------------------|
| ICLN  | 01                             | Trace Command Processor (DFSICLN5) |

The following table shows:

- The label used for the reason code
- The reason code value
- The description of the error

The labels shown in the following table can be used to scan the module source code to locate where the message was issued from.

Table 72. DFS081 reason (RSN) codes table

| Label  | Reason code<br>decimal/<br>hexadecimal | Description                                                        |
|--------|----------------------------------------|--------------------------------------------------------------------|
| EXTIKW | 01/01                                  | Invalid keyword for trace exit                                     |
| EXTIPT | 02/02                                  | Invalid parameter type for trace exit command.                     |
| EXTNPT | 03/03                                  | No parameter type was specified for trace exit command.            |
| EXTMPT | 04/04                                  | Multiple parameter types for trace exit command.                   |
| EXTMCB | 05/05                                  | Missing DFSMSCB control block for the trace exit DFSMSCEO command. |
| EXTIPS | 06/06                                  | Invalid parameter subtype for the trace exit command.              |
| EXTENS | 07/07                                  | Trace exit is not supported for this environment.                  |
| EXTENL | 09/09                                  | Required exit is not loaded for start trace command.               |
| EXTSCF | 10/0A                                  | System command failure.                                            |

Table 72. DFS081 reason (RSN) codes table (continued)

| Label  | Reason code decimal/hexadecimal | Description               |
|--------|---------------------------------|---------------------------|
| EXTIPL | 11/0B                           | Invalid parameter length. |

### DFS070 diagnostic message

This is an example of the DFS070 diagnostic message.

```
DFS070 UNABLE TO ROUTE MESSAGE RSN=0104
```

The RSN code identifies the module that issued the message (01 = DFSICIO0) and the reason for the error (04 = Prefix buffer length is too large).

In this case DFSICIO0 called the message generator (DFSCLMR0) with R1 = 00680046.

```
Where x'00680046' = module identifier, reason code,message key
                x'0068' = 0104 (decimal)
                    01 = Module that issued message = DFSICIO0
                    04 = Prefix buffer length is too large
                x'0046' = 70 (decimal) = DFS070 MESSAGE KEY
```

The following table shows:

- The label used for the module identifier
- The identifier
- The module function or name

The labels shown in the following table can be used to scan the module source code to locate where the message was issued from.

### Contents of the DFSMSCE0 trace records

DFSMSCE0 records are type X'6701' with a trace ID of MSEA (entry) or MSEB (exit).

Refer to the DFSMSCEB macro for contents of the MSCEB block.

#### PROGRAM ROUTING

- MSCEB (Message routing exit interface block)
  - (CHNG/ISRT call)
- PCB (CHNG/ISRT call)
- MESSAGE PREFIX (CHNG/ISRT call)
- MESSAGE SEGMENT (ISRT call) maximum of 256 bytes

#### LINK RECEIVE

- MSCEB (Message routing exit interface block)
- MESSAGE PREFIX

#### TERMINAL ROUTING

- MSCEB (Message routing exit interface block)
- MESSAGE SEGMENT maximum of 256 bytes

**Important:** To assist in diagnosing DFSMSCE0 exit problems, the MSCEB block will maintain the following information:

- 8-byte eye catcher 'DFSMSCEB'
- 4-byte Routing exit type:

```
TRTB|TRVT|TR62|TROT|LRTR|LRLT|LRIN|LRDI|PRCH|PRIS
```

- 4 byte Address of ECB
- 4 byte Address of interface block
- 4 byte Address of DFSMSCEO exit parameter list

## Diagnosing routing errors by using the transaction trace or program trace

The transaction trace or program trace can be used to diagnose routing error problems that are related to the user program routing exit DFSMSCEO.

By setting this trace on for a transaction or program, IMS logs a 6701-LA3A record at entry to DFSDLA30, and a 6701-LA3B when DFSDLA30 returns to the application program. In addition IMS logs a 6701-MSEA record when the exit is entered, and a 6701-MSEB when the exit returns to IMS. IMS also logs a 6701-MSCE error record, for each DFSMSCEO related routing error.

Module DFSDLA30 receives control for every user application program call to a TPPCB (such as an I/O TPPCB or an alternate TPPCB). The DFSMSCEO routing exit can be tailored to receive control for the first ISRT call of each new message to an I/O TPPCB or alternate TPPCB, or for each CHNG call to a alternate modifiable TPPCB.

For example, if the transaction trace is active for TRANA, and a TRANA message is processed and the user application program issues a ISRT to an alternate TPPCB, and the DFSMSCEO exit is being used to route ISRT calls, IMS traces the following records with this command:

```
/TRACE SET ON TRANSACTION transaction_name
```

```
6701-LA3A - DFSDLA30 called to process ISRT call
6701-MSEA - DFSMSCEO called to process ISRT route
6701-MSEB - DFSMSCEO returns
6701-MSCE - Logged if routing error detected, even if tran/prog trace
             is not active
6701-LA3B - DFSDLA30 returns (ISRT/route processed)
```

To trace the DL/I portion of data communication for a specific program, issue the following command:

```
/TRACE SET ON PROGRAM program_name
```

For program routing exit (DFSMSCEO) call errors, TPPCB status, AIBRETRN, and AIBREASN codes are set.

### Related tasks

“IMS transaction trace” on page 307

The IMS transaction trace writes entries to the IMS log at entry to and exit from the DC call analyzer (DFSDLA30).

### TPCB STATUS, AIBRETRN, and AIBREASN codes for DFSDLA30 routing errors

The TPCB STATUS, AIBRETRN, and AIBREASN codes for DFSDLA30 routing errors are listed and described.

TPCB STATUS, AIBRETRN, and AIBREASN codes for DFSDLA30 routing errors are given in the following format:

| TPCBSTAT | AIBRETRN | AIBREASN       | COMMENTS                              |
|----------|----------|----------------|---------------------------------------|
| A1       | 00000104 | MSERQINV(0560) | EXIT ROUTE REQUEST INVALID (DFSMSCEO) |

The complete list of return and reason codes is available in the DFSAIBEQ macro.

## Diagnosing routing problems by using the DC LINE/NODE/LINK TRACE

The DC trace traces line, node, and MSC link activity. It can be used in conjunction with the DFSMSCEO exit trace to diagnose message routing problems in the terminal routing, input message routing, and link receive exits.

These traces log 6701 log records with a variety of trace IDs (such as: 6701-A01). If any of these traces is active, IMS logs a 6701-MSEA record when the message routing exit is called and a 6701-MSEB log



record when the exit returns. For example, if the node trace is active, the following trace records are logged:

```
6701-A01 - DC analyzer (DFSICI00) is called to process the message
          LINK the DFSMSCE0 trace will log X'6701' records with a
          trace ID of MSEA (entry) or MSEB (exit) for terminal
          routing or link receive. Refer to DFSMSCEB macro for
          the contents of the MSCEB block.

6701-MSEA - DFSMSCE0 called to process the message

6701-MSEB - DFSMSCE0 returns

6701-MSCE - Logged if routing error detected, even if the line, node,
          or link trace is not active

6701-A03 - DC Analyzer determines what to do next
```

## Using 01/03 log record trace

The 01/03 log record trace reflects the user exit routines called and the user options requested by the various user exits.

A double word trace to reflect the user routing request is included in the Transaction Management Router Segment of the 01/03 log records. The trace reflects:

```
BYTE 1 - user parameter list (DFSMSCEP) flag 1
         indicates the user routing exits called.

BYTE 2-3 - User Terminal Routing flags 2 and 3
           (DFSMSCEP MSTRFL2 and MSTRFL3) indicates
           the user Terminal Routing options.

BYTE 4-5 - User Link Receive Routing flags 2 and 3
           (DFSMSCEP MSLRFL2 and MSLRFL3) indicates
           the user LINK Routing options.

BYTE 6-7 - User Program Routing flags 2 and 3
           (DFSMSCEP MSPRFL2 and MSPRFL3) indicates
           the user Program Routing options.

BYTE 8 - Currently unused
```

## IMS transaction trace

The IMS transaction trace writes entries to the IMS log at entry to and exit from the DC call analyzer (DFSDLA30).

### Starting the trace

To start the trace, issue one of the two following /TRACE commands.

To trace the DL/I portion of data communication for a specific transaction:

```
/TRACE SET ON TRAN transaction name
```

To trace the DL/I portion of data communication for a specific program:

```
/TRACE SET ON PROGRAM program name
```

### Content of the trace records

DFSDLA30 records are type X'6701' with a trace ID of LA3A (entry) or LA3B (exit). They contain:

- PCB
- Maximum of 64 bytes of the I/O area
- MODNAME
- PST
- SMB of the transaction (if the program in the IMS control region is an MPP or a message driven BMP)

The PCB and PST areas are always logged. The I/O area, MODNAME, and SMB are additional areas that are logged when available and applicable to the call type:

- The I/O area can be logged only on entry or exit. For example, a GN call logs the I/O area on exit, while an ISRT call logs the I/O area on entry. Depending on the call type, the I/O area can be logged on both entry and exit.
- The MODNAME is logged only on an entry trace.
- The SMB is logged on both the entry and exit traces.

Field PSTSYNFC in the PST contains the following calls:

- 04** ABTERM IN PROGRESS
- 08** SYNC POINT PHASE 1
- 0C** SYNC POINT PHASE 2
- 10** PURGE TP PCBS
- 14** PHASE 1 SYNC POINT ENQ OUTPUT TO TEMP DEST
- 18** ROLB CALL
- 1C** INVALID ABENDU0820
- 20** ABORT

Field PSTFUNCT in the PST contains the following calls:

- 01** GU
- 03** GN
- 41** ISRT
- 50** SETO
- 67** INQY
- 83** CHNG
- 85** CHKP
- 87** CMD
- 88** GCMD
- 89** ROLB
- 8A** ROLS
- 8C** SETS

8F  
AUTH  
90  
PURG

The following figure is an example of a IMS transaction trace.

**Example of IMS transaction trace records**

```

INTERNAL TRACE RECORD          ID = LA3A  SEGNO=00  RECNO = 0000009A  TIME  07.45.06.42  DATE  93.014
PCB
0271B084 000000 00300038 00010018 40404040 40404040 006DD054 00000000 00009F58 C9D6D7C3
*.....IOPC*
0271B0A4 000020 C2404040 00000000 00000000 00000000 0271B084 E6E3D6D9 40404040
*B.....DWTOR*
0271B0C4 000040 12004040 0093014F 0745063F 00000006 40404040 40404040 40404040
*...L.|.....*
0271B0E4 000060 40404040 40404040
*.....*
I/O AREA
02825000 000000 00340000 C3E4E2E3 D6D4C5D9 40D9C5D8 E4C5E2E3 E240C9D5 C6D6D9D4 C1E3C9D6 *...CUSTOMER REQUESTS
INFORMATIO*
02825020 000020 D540D6D5 40D7C1F2 F860F1F6 F140D4D6 C4C5D3E2 00000000 00000000 00000000 *N ON PA28-161
MODELS.....*
MODNAME
82825850 000000 D4D6C4F4 F0F0F4F2
*MOD40042
SMB
027CA754 000000 00000000 00000000 00000000 00000000 00000000 00810075 00020002 D7C1D9E3
*.....A.....PART*
027CA774 000020 40404040 41416000 0700A704 FFFFFFFF 00000002 FFFFFFFF 00001D1D 027D5410
*.....X.....*
027CA794 000040 00000000 0100FFFF 0000FFFF 00000000 027CA7C8 00000000 C4C6E2E2 C1D4F0F2
*.....@XH....DFSSAM02*
027CA7B4 000060 40404040 40404040 00000000
*.....*
PST
0271B060 000000 00000000 82801A39 02978C04 02CB51DC 00000000 00000000 00000000 00000000
*...B...P.....*
0271B080 000020 02819040 00300038 00010018 40404040 40404040 006DD054 00000000 00009F58
*..A.....*
0271B0A0 000040 C9D6D7C3 C2404040 00000000 00000000 00000000 00000000 0271B084 E6E3D6D9
*IOPCB.....DWTOR*
0271B0C0 000060 40404040 12004040 0093014F 0745063F 00000006 40404040 40404040 40404040
*...L.|.....*
0271B0E0 000080 40404040 40404040 40404040 00000000 00000000 00000000 02C5A758 00000000
*.....EX.....*
0271B100 0000A0 00000000 00000000 04000002 02CB5148 00000000 027CA754 0094000E 01420080
*.....@X..M.....*
0271B120 0000C0 02CB5138 04000002 00000000 00000001 00000001 00000000 02825840 0280E610
*.....B...W.*
0271B140 0000E0 006D3D08 00000000 00000000 02825000 0275DC40 00000000 00000080 00000000
*...B&;.....*
0271B160 000100 00000000 0288B020 01020304 00000000 00000000 00000000 D4D7D740 40404040
*.....MPP.....*
0271B180 000120 D4D7D740 40404040 00000000 00000000 00000000 00000000 00000000 00000000
*MPP.....*
0271B1A0 000140 00000000 00000000 00000000 00000000 00000001 00000000 00000001 00000000
*.....*
0271B1C0 000160 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0271B1E0 000180 00000000 00000000 00000000 00000000 00000000 00000000 00000000 028258A8
*.....B..Y*
0271B200 0001A0 00000000 00000000 C5C0FFFF 8A000000 C9E2D9E3 4140BA07 0271B084 00000000
*.....E.....ISRT.....D.....*
0271B220 0001C0 00000002 00C53D20 00000000 00000000 00000000 00000000 00000000 00000000
*.....E.....*
0271B240 0001E0 00000000 00000000 000000A0 02000000 00000000 00000000 00000000 00000000
*.....*
0271B260 000200 00000000 00000000 8299C762 00000000 00000000 00000000 00000000 00000000
*.....BRG.....*
0271B280 000220 00000000 00000000 00000000 0290B210 00000000 00000000 00000000 00000000
*.....*
0271B2A0 000240 00000000 00000000 00000000 00000000 00000002 000E0300 02825000
*.....B&;*
0271B2C0 000260 02707540 00000000 027573A4 00000000 00000000 00000000 00000000 00000000
*...U.....*
0271B2E0 000280 C9E2D9E3
*ISRT
INTERNAL TRACE RECORD          ID = LA3A  SEGNO=01  RECNO = 0000009B  TIME  07.45.06.42  DATE  93.014
CONTINUE
0271B2E4 000284 00000000 00000000 00000000 0271B084 00000000 00000000 00000000 00000000
*.....D.....*
0271B304 0002A4 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0271B324 0002C4 00000000 00000000 00000000 00000004 00F76180 00000000 00000840 00000000
*.....7/.....*

```

|                              |          |          |          |          |          |               |          |          |          |
|------------------------------|----------|----------|----------|----------|----------|---------------|----------|----------|----------|
| 0271B344                     | 0002E4   | 00011C00 | 0271B3D8 | 10000000 | 00000000 | 00000000      | 00008000 | C0808000 | 24008000 |
| *.....Q.....*                | 0271B364 | 000304   | 00000000 | 00000000 | 00000000 | 0275DC54      | 00000000 | 00000000 | 00000000 |
| *.....*                      | 0271B384 | 000324   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 00000000 | 00000000 |
| *.....*                      | 0271B3A4 | 000344   |          |          |          | SAME AS ABOVE |          |          |          |
| *.....*                      | 0271B3C4 | 000364   | 00000000 | 00000000 | 00000000 | 00000BC8      | 08000000 | 0271B060 | 00000000 |
| *.....H.....*                | 0271B3E4 | 000384   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 00000000 | 00000000 |
| *.....*                      | 0271B404 | 0003A4   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 028225A8 | 00000000 |
| *.....B.Y.....*              | 0271B424 | 0003C4   | 00000000 | 00000000 | 026DE040 | 00004B00      | 000E15E6 | 00196FF2 | 00000000 |
| *.....W.?2.....*             | 0271B444 | 0003E4   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 028BB000 | 00000000 |
| *.....*                      | 0271B464 | 000404   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 00000000 | 00000000 |
| *.....*                      | 0271B484 | 000424   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 00000000 | 0275D83B |
| *.....Q.....*                | 0271B4A4 | 000444   | 0275D73C | 00000000 | 07004040 | 40404040      | 00000000 | 00000000 | 0275DA3C |
| *.....P.....*                | 0271B4C4 | 000464   | 00000000 | 0275D83C | 00000000 | 00000000      | 00000000 | 00000000 | 00000000 |
| *.....Q.....*                | 0271B4E4 | 000484   | 00000000 | 028FCA40 | 02759040 | 00000000      | 00C16190 | 00000000 | 0271BC28 |
| *.....A/.....*               | 0271B504 | 0004A4   | 00000000 | 00000000 | 00000000 | 0280E450      | 0280E714 | A6E4A497 | 78F98705 |
| *.....U&;X.WUUP.9G..7..*     | 0271B524 | 0004C4   | 026EB048 | 006DD000 | 00340000 | 00000000      | 00800000 | 00000000 | 00000000 |
| *.....>.....*                | 0271B544 | 0004E4   | AD2CD246 | 0275DD0C | 00000000 | 00000001      | 00000000 | 00000000 | 0275DD38 |
| *.....K.....*                | 0271B564 | 000504   | 00000000 | C4C6E2E2 | C1D4F0F2 | 0280E610      | 00000000 | 00000000 | 000C4040 |
| *.....DFSSAM02..W.....*      | 0271B584 | 000524   | 00000000 | 00000000 | 00000000 | 00000000      | 00000000 | 00000000 | 00000000 |
| *.....<.....*                | 0271B5A4 | 000544   | 00000000 | 00000000 | 02757040 | 00000000      | 00000000 | 00000000 | 569ABC9A |
| *.....<..WTOR.....*          | 0271B5C4 | 000564   | 00000000 | 00001D1D | 0271B0BC | 00000000      | 014C0000 | E6E3D6D9 | 40404040 |
| *.....<..WTOR.....*          | 0271B5E4 | 000584   | 000056E0 | 00000000 | 00196D3D | 0280E524      | 00000000 | 00000001 | 0000FFFF |
| *.....V.....B#..*            | 0271B604 | 0005A4   | 80000000 | 0271B648 | 829B8A1E | 82978630      | 00000000 | 0271B060 | 827BEC70 |
| *.....B...BPF.....-B#..*     | 0271B624 | 0005C4   | 0271B060 | 0280E610 | 02825840 | 829B891C      | 02825000 | 026EB048 | 00000064 |
| B.I..B&;>.....E..*           | 0271B644 | 0005E4   | 029B81E8 | 00000000 | 0271B600 | 0271B690      | 82978774 | 0297C2FE | 00000000 |
| *..AY.....BPG..PB.....*      | 0271B664 | 000604   | 02825840 | 0271B084 | 02825000 | 82825850      | 02825840 | 829B891C | 82978630 |
| B.I..BPF.....-*              | 0271B684 | 000624   | 82978698 | 00C53D20 | 82978630 | 00000000      | 0271B648 | 0271B6D8 | 8297C424 |
| *BPFQ.E..BPF.....QBPD..D\$.* | 0271B6A4 | 000644   | 00000004 | 02707540 | 0000000C | 0271B084      | 02825000 | 02707554 | 02707598 |
| *.....D.B&;.....QB.I.*       |          |          |          |          |          |               |          |          | 829B891C |

|                                  |           |          |                  |                  |             |          |          |          |          |          |
|----------------------------------|-----------|----------|------------------|------------------|-------------|----------|----------|----------|----------|----------|
| INTERNAL TRACE RECORD            | ID = LA3A | SEGN0=02 | RECNO = 0000009C | TIME 07.45.06.42 | DATE 93.014 |          |          |          |          |          |
| CONTINUE                         | 0271B6C4  | 000664   | 0297C488         | 0271B060         | 0297C4A0    | 00C53D20 | 0297C2FE | 00000000 | 0271B690 | 0271B720 |
| *.PDH...-.PD...E...PB.....*      | 0271B6E4  | 000684   | 82C45D79         | 82999D60         | 00C53D20    | 0271B060 | 00000410 | 00000584 | 0272E61C | 02707598 |
| *BD).BR.-.E.....D..W....Q*       | 0271B704  | 0006A4   | 02707554         | 0271B6C4         | 0272E5A4    | 0271B060 | 82C45E38 | 00C53D20 | 02C45B80 | 00000000 |
| BD;..E...D\$.**                  | 0271B724  | 0006C4   | 0271B6D8         | 0271B768         | 8299B341    | 0299BAEC | 000E3E8D | 00003E8D | 0299AD60 | 000E3E8D |
| *...Q...BR...R.....R.....*       | 0271B744  | 0006E4   | 00000000         | 00000410         | 0271B068    | 8299A28A | 00C19E00 | 0271B060 | 00C19000 | 00C53D20 |
| *.....BRS..A.....-A...E..*       | 0271B764  | 000704   | 82999D60         | 00000000         | 0271B720    | 0271B7B0 | 8299B341 | 0299BAEC | 00C53D20 | 027BED10 |
| *BR.-.E...#..*BR...R...E...#..*  | 0271B784  | 000724   | 0299AD60         | 00C53D20         | 00000000    | 02707540 | 0272E594 | 829B891C | 0272E078 | 0271B060 |
| *.R.-.E.....VMB.I.....-*         | 0271B7A4  | 000744   | 00C19000         | 00C53D20         | 82999D60    | 00000000 | 0271B768 | 0271B7F8 | 8299BD25 | 829CE580 |
| *.A...E..BR.-.BRR..B.V..*        | 0271B7C4  | 000764   | 00C53D20         | 027BED10         | 027BED10    | 00000024 | 00000004 | 02707540 | 0272E594 | 829B891C |
| *.E...#..#.....VMB.I..*          | 0271B7E4  | 000784   | 0272E078         | 0271B060         | 00C19000    | 00C53D20 | 0299BC2C | 00000000 | 0271B7B0 | 0271B840 |
| *.....A...E...R.....*            | 0271B804  | 0007A4   | 8299BF17         | 829CA578         | 00C53D20    | 027BED10 | 027BED10 | 00000028 | 0272E604 | 02707588 |
| *BR..B.V..E...#..#.....W....H*   | 0271B824  | 0007C4   | 02707550         | 0271BC48         | 0272E5A4    | 0271B060 | 00C19000 | 00C53D20 | 0299BE12 | 00000000 |
| *...&;...VU...-A...E...R.....*   | 0271B844  | 0007E4   | 0271B7F8         | 0271B888         | 8299BD25    | 829CE580 | 00C53D20 | 027BED10 | 027BED10 | 00000024 |
| *...S...HBR..B.V..E...#..#.....* | 0271B864  | 000804   | 00000004         | 02707540         | 0272E594    | 00000832 | 0272E078 | 0271B060 | 00C19000 | 00C53D20 |
| *.....VM.....-A...E..*           | 0271B884  | 000824   | 0299BC2C         | 0271B600         | 0271B840    | 0271B8D0 | 82957237 | 829A19C8 | 00000000 | 0275F260 |
| *.R.....BN..B..H.....2..*        | 0271B8A4  | 000844   | C3D5E340         | 000001FF         | 02C5A758    | 02C5A758 | 00000000 | 00C34200 | 00C2A1C8 | 0271B060 |
| *CNT...EX..EX.....C...B.H...*    | 0271B8C4  | 000864   | 0271B060         | 00C53D20         | 0295703E    | 00000000 | 0271B888 | 0271B918 | 829A1ACB | 029A248E |
| *...-E...N.....H...B.....*       |           |          |                  |                  |             |          |          |          |          |          |

```

0271B8E4 000884 00000000 00F76180 C3D5E340 000001FF 02C5A758 02C5A758 0271B04C 00000000
*. . . 7/.CNT . . . .EX..EX..< . . . *
0271B904 0008A4 027BEC70 0271B060 0275F260 00C53D20 829A19C8 00000000 0271B8D0 0271B960
*. #. . . . .2-.E..B..H. . . . . *
0271B924 0008C4 829A2579 829554F8 00C53D20 00C2A238 C3D5E340 000001FF 02C5A758 02C5A758
*B. . . BN.8.E. . . BS.CNT . . . .EX..EX.*
0271B944 0008E4 00C2A238 00000000 027BEC70 0271B060 0275F260 00C53D20 029A248E 00000000
*. BS. . . . #. . . . .2-.E..B..H. . . . . *
0271B964 000904 0271B918 0271B9A8 8011566B 829CA578 000053E8 02766910 00000000 02B54000
*. . . . .Y. . . . B.V. . . . .Y. . . . . *
0271B984 000924 000053E8 02766900 00000000 02766910 0271B0EC 0271B060 02B56260 00C53D20
*. . . . .Y. . . . .E. . . . . *
0271B9A4 000944 00115588 00000000 0271B960 0271B9F0 8011566B 829CA578 02B541D8 02766910
*. . . . .H. . . . .0. . . . B.V. . . . Q. . . . *
0271B9C4 000964 02B541D0 00000000 02B541D8 02766900 02B54000 02766910 0271B0EC 0271B060
*. . . . .Q. . . . . *
0271B9E4 000984 00053CE0 00C53D20 00115588 00000000 0271B9A8 0271BA38 8011566B 829CA578
*. . . . .E. . . . .H. . . . .Y. . . . .B.V. . . . *
0271BA04 0009A4 02B541D8 02766910 02B541D0 00000000 02B541D8 02766900 02B54000 02766910
*. . . . .Q. . . . .Q. . . . . *
0271BA24 0009C4 0271B0EC 0271B060 00053CE0 00C53D20 00115502 00000000 0271B9F0 0271BA80
*. . . . .E. . . . .0. . . . . *
0271BA44 0009E4 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BA64 000A04 SAME AS ABOVE
0271BA84 000A24 0271BA38 0271BAC8 00000000 00000000 00000000 00000000 00000000 00000000
*. . . . .H. . . . . *
INTERNAL TRACE RECORD ID = LA3A SEGNO=03 RECNO = 0000009D TIME 07.45.06.42 DATE 93.014
CONTINUE
0271BAA4 000A44 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BAC4 000A64 00000000 00000000 0271BA80 0271BB10 00000000 00000000 00000000 00000000
* . . . . . *
0271BAE4 000A84 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BB04 000AA4 00000000 00000000 00000000 00000000 0271BAC8 028041A8 00000000 00000000
* . . . . .H. . . . .Y. . . . . *
0271BB24 000AC4 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BB44 000AE4 00000000 00000000 00000000 00000000 00000000 00000000 028042C8 027579C8
* . . . . .H. . . . .H *
0271BB64 000B04 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BB84 000B24 SAME AS ABOVE
0271BBA4 000B44 C4C6E2E2 C1D4F0F2 00000000 00000000 80000000 00000000 00000000 80801000
*DFSAM02 . . . . . *
0271BBC4 000B64 002A2A00 00410000 00000000 00000000 00000000 00000000 00000000 0093014F
* . . . . .L. | *
0271BBE4 000B84 0743506F 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . .&?; . . . . . *
0271BC04 000BA4 00000000 00000000 00000000 02707540 00000000 00000000 00000000 00000000
* . . . . . *
0271BC24 000BC4 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* . . . . . *
0271BC44 000BE4 00000000
* . . . . . *

```

### Related concepts

“[Diagnosing routing errors by using the transaction trace or program trace](#)” on page 306

The transaction trace or program trace can be used to diagnose routing error problems that are related to the user program routing exit DFSMSCEO.

### Related tasks

“[Obtaining diagnostics in addition to SCRAPLOG and 6701-MRQE](#)” on page 295

When the 6701-MRQE diagnostic records and the SCRAPLOG records do not provide enough diagnostic detail to adequately diagnose a problem, you can obtain additional diagnostic details by issuing the **/TRACE SET ON PROGRAM** command. **/TRACE SET ON pgmname** causes the logging of additional 6701-MRQB records when the QCF BMP is processing.

## Receive-any buffer analysis

While talking with level 1 or level 2 IBM Software Support representatives, you might need to determine if you are out of receive-any (RECANY) buffers. Use either the IMS IPCS panel interface or the manual procedure to help you determine if this is the case. As you proceed through the steps, write down the information you gather.

## IMS IPCS Dump Formatter panel

The IMS IPCS Dump Formatter provides a panel-driven interface to perform analysis.

Using this IMS IPCS Dump Formatter panel, choose the RECANY (receive any) selection in the EDA/TM (Enhanced Dump Analysis/Transaction Manager) option, shown in the following figure, to create an output that contains the RECANY information.

```
----- RECEIVE ANY BUFFERS FORMATTING OPTIONS -- Row 1 to 3 of 3
COMMAND ==> Scroll ==> PAGE

The Receive Any Buffer contains input data that IMS receives from
VTAM terminals.

S = SELECT Select choice plus required ARGument
M = SELECT (minimum data) and hit enter to process. Use UP/DOWN
X = SELECT (maximum data) to scroll.

Cmd Option Type ARG Argument description
v-----vvvvvvvv-----
_ RECANY TYPE All Receive Any Buffers (leave ARG blank)
_ RECANY FILTER Receive Any Buffer filtering option
_ RECANY FILTER ALLOCATE Filter for allocated buffers
***** Bottom of data *****
```

Figure 68. IPCS Dump Formatter EDA/TM option

### Related tasks

[“Manual process to determine receive-any buffers space issues” on page 312](#)

While talking with level 1 or level 2 IBM Software Support representatives, you might need to determine if you are out of receive-any (RECANY) buffers. As you proceed through the steps, write down the information you gather.

## Manual process to determine receive-any buffers space issues

While talking with level 1 or level 2 IBM Software Support representatives, you might need to determine if you are out of receive-any (RECANY) buffers. As you proceed through the steps, write down the information you gather.

1. Find the address of the first RECANY buffer.
  - a) SCD+X'91C' = pointer to the first RECANY buffer (SCDRECPT)
  - b) SCD+X'920' = size of each RECANY buffer (SCDRCSIZ)
  - c) SCD+X'922' = number of RECANY buffers (SCDRCANY)
2. Offset X'04' in the RECANY buffer points to the next RECANY buffer. You can follow the chain of RECANY buffers using the pointer at offset X'04'.
3. Examine offset X'90' in each RECANY buffer (4 bytes). This field contains either an address of a CLB or zeros. If it contains a CLB address, the buffer is in use. If it contains zeros, in most cases the buffer is available.
4. If the buffer is tied to a CLB, the data you find in the following fields in the CLB is helpful in problem diagnosis.

- a) CLB+X'00'-> Event Control Block (ECB) (4 bytes)
- b) CLB+X'20'-> VTAM CID of the session (CLBCID) (4 bytes)
- c) CLB+X'24'-> QE for queued receive-any buffers (CLBQE) (4 bytes)
- d) CLB+X'30' = Flag bytes (CLBFLAG1) (4 bytes)
- e) CLB+X'68'-> Input buffer (CLBINBUF) (4 bytes)
- f) CLB+X'6C'-> Output buffer (CLBOUTBF) (4 bytes)
- g) CLB+X'70' = QE for responses (CLBQERES) (4 bytes)
- h) CLB+X'74' = Flag bytes (CLBVFLAG) (4 bytes)

### Related tasks

“IMS IPCS Dump Formatter panel” on page 312

The IMS IPCS Dump Formatter provides a panel-driven interface to perform analysis.

## Finding the active save set

To analyze data communication (DC) problems, you need to find the active save set at the time of abend.

Use the following steps to locate the active save set.

1. Locate the registers at entry to abend (error registers). Register 13 points to the address of the active save set.
2. The active save sets begin under eye catcher **\*\*\* SAVE AREA SET\*\*\***.
3. Find the save area (SA) address that matches the address in error register 13.

### Example of a Save Area Set

If error register 13 contains 320548, you would analyze the save set flow as shown the following figure. The registers in this save set are the registers that are saved on entry to each module.

```

***SAVE AREA SET***

EP DFSICI00
SA 22FE930

EP DFSCFEI0
SA 22E930

EP DFSCFEP0
SA 22E990

EP DFSCIOC0
SA 229490

EP DFSQMGR0
SA 22D990

EP DFSAOS80
SA 320548

```

## IMS VTAM interface

The basic functions of an IMS DC operation are establishing communications, sending and receiving messages, and terminating communications. The execution of these functions is shared among the elements that make up the network: the terminal, the controller, the VTAM system, the IMS system, and the application.

The communications analyzer (DFSICI00) uses the request parameter list (RPL) block to communicate with VTAM, and VTAM returns its status to IMS in the RPL. Therefore, it is important to analyze the RPL.

## IBM 3270 error recovery analysis

---

When the IBM 3270 detects an error, it sends the processor one of four sense-status messages.

- Intervention required, such as printer out of paper
- DEVICE END, which indicates the end of an operation
- DEVICE BUSY, normally caused by an operational error
- Hardware I/O error within the 3270 complex, such as a data check, control check, or equipment check

If IMS receives a sense-status message other than a DEVICE END, it issues message DFS973I.

## Diagnosing Message Format Service problems

---

The number of physical terminals traced and the number of lines traced can affect completeness of trace records and sequence of trace entries.

- Completeness of the trace record, (that is, whether or not all module activity related to a particular I/O action is traced), is affected if only one physical terminal (PTERM) is traced. The device-dependent module occasionally can change the current PTERM pointer before returning to the analyzer. Because the trace switch is kept in the CTB and is checked upon entry of a particular code, some module trace entries might be missing if the current CTB is not always maintained.
- Sequence of entries can be broken if more than one line is traced at a time. In this case, entries for a particular line have to be related by CLB.

Trace records with the following identifiers are useful in diagnosing MFS problems.

### **DD6M**

EDIT SEGMENT INTO TP BUFFER

#### **CIB**

MOD/DOF name

#### **MFS SEG**

SEGMENT created by MFS from output message and MOD/DOF

### **D01/DDM1**

PREPARE TO WRITE TO TERMINAL

#### **CIB**

Offset X'00' contains 8-byte MOD name.

Offset X'0C' contains 8-byte DOF name.

### **A05**

PRIOR TO ISSUING VTAM I/O REQUEST (NORMALLY A WRITE)

#### **O TP BUF**

Contains the data to be written to the terminal and the RPL for VTAM devices. Refer to the previous A05 record.

### **A01**

TERMINAL INPUT READY FOR IMS PROCESSING

#### **I TP BUF**

Contains input "device segment" 6 to 36 bytes from the beginning of the buffer. The data is preceded by a 2-byte length and 2 bytes of zeros.

### **FMT2**

ENTRY TO MFS INPUT PROCESSING

#### **CIB**

Offset X'00' contains MID name.

Offset X'22' indicates if PFK or PA key is used.



**X'80'**

PA key

**X'40'**

PFK key

**X'21'**

PA or PFK number

**FMT1**

MESSAGE TO BE EDITED BY BASIC EDIT, NOT MFS

**FMT3**

MFS HAS COMPLETED A MESSAGE SEGMENT

**MFS SEG**

Shows input segment created by MFS.

**MFS I WK**

Shows complete input message (all segments) and internal segment control information used by DFSCFEIO.

**MFS P WK**

This trace record is displayed only when the content of a protected field that is returned from a 3270 or SLU2 device is altered.

Offset 4 contains the address of the altered field in the input buffer.

Offset 8 contains MOD name.

Offset x'10' contains DOF name.

Offset x'2C' points to the protected field entry (PFVENTRY).

**PFVENTRY**

Offset 0 points to the next entry.

Offset 4 is the length of the entry, which consists of an 8-byte header length and data length.

Offset 6 is the address of the device field buffer of the protected field.

Offset 8 is the original content of protected field.

**ICLR**

A message satisfied MSGDEL=NONIOBCB for its destination PTERM and was deleted. The relevant control blocks are traced:

- Destination CTT
- Telecommunication program communication block (TP PCB)
- Destination CLB
- Destination CTB

This trace record is produced when any trace level is active for the destination PTERM.

**Note:** To examine the segments placed in the message queue, see X'01' and X'03' log records. X'01' log records contain input message segments. X'03' log records contain output message segments.

**Related tasks**

[DC trace \(Diagnosis\)](#)

## Message Format Service module traces

The Communications Interface Block (CIB) contains two module traces: CIBSTRAC and CIBTRACE.

### CIBSTRAC trace

CIBSTRAC is located in the CIB + X'50'. This 4-byte trace entry contains information indicating which MFS modules received control and in what order. The following figure shows the format.

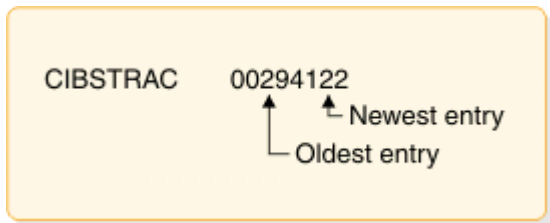


Figure 69. Example of CIBSTRAC trace

The leftmost nonzero digit shows the oldest entry and the high-order 4 bits of the rightmost byte show the newest. You can ignore the rightmost digit because it is always the same as the digit to its left. The trace entries are described in the following list.

#### Value (hex)

##### Meaning

- 1** Entry to DFSCFEQ0 (MFS resource cleanup).
- 2** Entry to DFSCFEI0 (MFS input editing occurred).
- 3** See value 8. Value 3 usually follows value 8 and is obtained by ORing 1 and 2.
- 4** INIT or DDFIN entry to DFSCFEO0 (either initial entry or after DDM6 finished current segment).
- 5** CONT entry to DFSCFEO0 (4 ORed with 1; after successful WRITE, next output segment was requested).
- 6** PAGEPOS entry to DFSCFEO0 (4 ORed with 2; entry after paging request).
- 7** DDNEXT entry to DFSCFEO0 (4 ORed with 3; DDM6 wanted next segment).
- 8** Entry to DFSCFEP0 (3 in the next slot; DFSCFEP0 flushed input message by calling DFSCFEQ0. After returning to DFSCFEP0, page position was established and exit to analyzer D was made. (Entry 8 was shifted left by DFSCFEQ0 entry and entry 1 was written. After returning to DFSCFEP0 1 was ORed with 2.)  
  
5 in the next slot; DFSCFEP0 flushed input message by calling DFSCFEQ0. After returning to DFSCFEP0, message dequeue routine was entered. Entry 8 was shifted and entry 1 was written by calling DFSCFEQ0. After returning to DFSCFEP0, DEQ routines ORed 1 with 4 resulting in 5.
- 9** Entry to DFSCFEP0 and exit to analyzer 3 entry. (8 ORed with 1).
- A** Entry to DFSCFEP0 (page position established) (8 ORed with 2).
- C** Entry to DFSCFEP0 and message dequeue requested. (8 ORed with 4).

**F**

Noninitial entry to DFSCFEI0

**CIBTRACE trace**

CIBTRACE is located in the extended CIB at CIB+X'70'. If the CIBSEXT flag is on (X'80'), an extended CIB exists. The following figure shows the format.

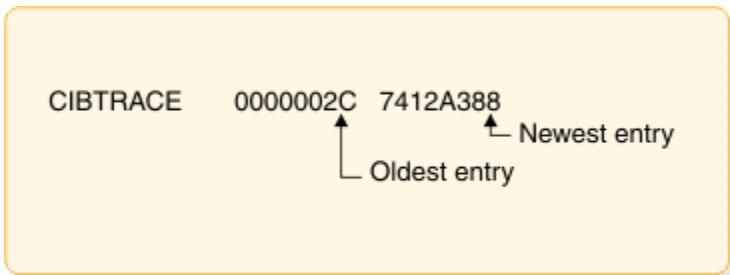


Figure 70. Example of CIBTRACE trace

The leftmost nonzero digit shows the oldest entry and high-order 4 bits of the rightmost byte show the newest. You can ignore the rightmost digit since it is always the same as the digit to its left. The trace entries are described in the following list.

**Value (hex)****Meaning****0**

ENDMSG entry to DFSCFEI0 (Tests for EOT and spanned operation). If spanned, ENQWORK; if not, set EOM and setup for spanned operation.

**1**

CPP100 entry to DFSCFEI0. Data was moved to message field.

**2**

CPP10 entry to DFSCFEI0. Field was padded with fill character or literal has been moved into field.

**3**

GETLBUF entry to DFSCFEI0. Acquire next line buffer. Return at entry GETLBUF2 with address of line buffer segment in register 1.

**4**

NOFIT entry to DFSCFEI0. Sets up for spanned operation.

**7**

GETWORK entry to DFSCFEI0. Acquire work buffer and initialize work buffer header. Moved data from QBUF to work buffer.

**8**

REFRESH2 entry to DFSCFEI0. DIF table was cleared and setup.

**9**

ENQWORK entry to DFSCFEI0. Segment in work buffer was moved to QBUF for processing.

**A**

FINQBUF entry to DFSCFEI0. Compress nulls out of segmenting work buffer.

**B**

NULLFDE entry to DFSCFEI0. Process all NULLFDEs.

**C**

PROCQBUF entry to DFSCFEI0. Return to analyzer to process QBUF.

**D**

GETQBUF entry to DFSCFEI0. Branches to analyzer entry C0 to acquire a QBUFFER.

**F**

ISRTNULL entry to DFSCFEI0. Inserts all null segments and processes them for move data.

## Tracing errors in module DFSCNXA0

DFSCNXA0 is the interface module between IMS and VTAM for all logon processing and abnormal session termination processing. It is often the first module to be notified when a failure occurs on a session and is always the first to get control when a node connects to IMS.

The session attributes are verified and the IMS session control blocks are built before the connection request is passed on to signon processing in IMS. The module consists exclusively of calls to VTAM exit routines.

### Location codes for DFSCNXA0 error messages

Message DFS3672I contains the location codes of the DFSCNXA0 error messages and the message also identifies the exit routine in which the error occurred.

Message DFS3672I contains the location codes listed in the following table.

Session failures might occur that do not cause any DFS messages to be issued by DFSCNXA0. In these cases, only message DFS3672 appears.

The format of the DFS3672I message is as follows:

```
DFS3672I SESSION ERROR. TYPE=aaa CODE=bb QUAL.=cc MSG=dddd
```

where

**aaa**

is the VTAM exit which was driven when the error occurred.

**bb**

is the location code of the error.

**cc**

is the location qualifier of the error.

Table 73. Location codes for DFSCNXA0 error messages

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                       |
|-------------------------|-----------------------------|------------|------|-------------------------------------------------------------------|
| 19                      | 13                          | 3862       | LOG  | Non-master terminal initiating a session on the alternate system. |
| 20                      | 14                          | 3100       | LOG  | Node in FP input mode.                                            |
| 21                      | 15                          | 3645       | LOG  | Generic Resource name used but VGR for ISC was disabled.          |
| 147                     | 93                          | 3645       | LOG  | Parsing for userdata failed for AUTOSIGN terminal                 |
| 151                     | 97                          | 3644       | LOG  | Could not get SOPB storage for AUTOSIGN terminal                  |
| 22                      | 16                          | 3645       | SCIP | Generic Resource name used but VGR for ISC was disabled.          |
| 1                       | 1                           | N/A        | LOST | No CID in VTAM parameter list.                                    |
| 2                       | 2                           | N/A        | LOST | CLB not found.                                                    |
| 3                       | 3                           | N/A        | LOST | Stacked logon chaining error.                                     |
| 4                       | 4                           | N/A        | LOST | CLBs do not match (stacked logon situation).                      |

Table 73. Location codes for DFSCNXA0 error messages (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                                      |
|-------------------------|-----------------------------|------------|------|----------------------------------------------------------------------------------|
| 5                       | 5                           | N/A        | LOST | CLBs do not match (nonstacked situation).                                        |
| 1                       | 1                           | N/A        | NSXT | No CLB in USERFLD of NIB (Cleanup RU).                                           |
| 2                       | 2                           | N/A        | NSXT | No CID.                                                                          |
| 3                       | 3                           | N/A        | NSXT | CLB not found (Cleanup RU).                                                      |
| 4                       | 4                           | N/A        | NSXT | CLB addresses do not match.                                                      |
| 5                       | 5                           | N/A        | NSXT | IMS APPLID not found in resolve in-doubt vector list.                            |
| 7                       | 7                           | N/A        | NSXT | Polarity mismatch on MSC link.                                                   |
| 8                       | 8                           | N/A        | NSXT | Polarity mismatch on MSC link.                                                   |
| 10                      | A                           | N/A        | NSXT | Not Cleanup, NSPE, or Notify—RU is invalid.                                      |
| 11                      | B                           | N/A        | NSXT | Invalid session key for NSPE.                                                    |
| 12                      | C                           | N/A        | NSXT | Invalid vector key for NOTIFY.                                                   |
| 13                      | D                           | N/A        | NSXT | Invalid session key for NOTIFY.                                                  |
| 21                      | 15                          | 2061       | NSXT | NSPE/NOTIFY processed.                                                           |
| 22                      | 16                          | 2061       | NSXT | NSPE/NOTIFY processed, AHDR not cleaned up.                                      |
| 23                      | 17                          | 2061       | NSXT | CLB not found (NOTIFY RU).                                                       |
| 1                       | 1                           | N/A        | RELQ | VTCB not found.                                                                  |
| 2                       | 2                           | N/A        | RELQ | Terminal defined with NORELRQ option.                                            |
| 3                       | 3                           | N/A        | RELQ | No CID in nonparallel-session VTCB.                                              |
| 4                       | 4                           | N/A        | RELQ | No CID in any parallel-session VTCBs.                                            |
| 1                       | 1                           | 1915       | SCIP | No pointer to RPL.                                                               |
| 2                       | 2                           | 1917       | SCIP | Node not found.                                                                  |
| 3                       | 3                           | 3862       | SCIP | VTCB not found (XRF Alt.).                                                       |
| 4                       | 4                           | 3862       | SCIP | Invalid temporary VTCB (XRF Alt.).                                               |
| 5                       | 5                           | 3862       | SCIP | BIND not on surveillance link (XRF Alt.).                                        |
| 6                       | 6                           | 3101       | SCIP | BIND not from same APPLID.                                                       |
| 7                       | 7                           | 3101       | SCIP | BIND rejected after setting VLGFF.                                               |
| 8                       | 8                           | 2104       | SCIP | Non-LU 6.1 node.                                                                 |
| 9                       | 9                           | 3111       | SCIP | Node stopped.                                                                    |
| 10                      | A                           | 3101       | SCIP | Logoff requested.                                                                |
| 11                      | B                           | 3101       | SCIP | SPQB already allocated. Another 3672 (code=2D) is sent, after the -resp is sent. |

Table 73. Location codes for DFSCNXA0 error messages (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                |
|-------------------------|-----------------------------|------------|------|--------------------------------------------|
| 12                      | C                           | 3101       | SCIP | BIND not from same APPLID.                 |
| 13                      | D                           | 3101       | SCIP | BIND rejected after setting CLBVLGFF flag. |
| 14                      | E                           | 2104       | SCIP | CLEAR for non-ISC node.                    |
| 15                      | F                           | 970        | SCIP | UNBIND entry message sent (after posting). |
| 16                      | 10                          | 1931       | SCIP | ASR processing begins.                     |
| 17                      | 11                          | 2104       | SCIP | SDT for non-ISC node.                      |
| 18                      | 12                          | 1915       | SCIP | Invalid command in RPL.                    |
| 22                      | 16                          | 79         | SCIP | Queues not available.                      |

#### Codes related to ISC processing

The codes in the following table relate to ISC processing—either as a result of LOGON or SCIP exits being driven. This is reflected in the DFS3672 message with 'I' appended to the exit type.

Table 74. Codes related to ISC processing

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                              |
|-------------------------|-----------------------------|------------|------|------------------------------------------|
| 1                       | 1                           | 79         | ISC  | IMS shutting down.                       |
| 2                       | 2                           | 1914       | ISC  | Bad INQUIRE return code.                 |
| 3                       | 3                           | 1914       | ISC  | Bad INQUIRE feedback.                    |
| 4                       | 4                           | 2066       | ISC  | USERFLD is zeros.                        |
| 5                       | 5                           | 2066       | ISC  | First structured field not 0.            |
| 6                       | 6                           | 2066       | ISC  | User field length = 0.                   |
| 7                       | 7                           | 2066       | ISC  | Primary Session Qualifier length = 0.    |
| 8                       | 8                           | 2066       | ISC  | Primary Session Qualifier length > 8.    |
| 9                       | 9                           | 2066       | ISC  | Secondary Session Qualifier length = 0.  |
| 10                      | A                           | 2066       | ISC  | Secondary Session Qualifier length > 8.  |
| 11                      | B                           | 3107       | ISC  | SPQB found but allocated.                |
| 12                      | C                           | 3107       | ISC  | SPQB CRB pointer <> 0.                   |
| 13                      | D                           | 2049       | ISC  | VTCB not found and no dynamic terminals. |
| 14                      | E                           | 3101       | ISC  | No available VTCBs.                      |
| 15                      | F                           | 3107       | ISC  | Session initialization already begun.    |
| 16                      | 10                          | 3101       | ISC  | Second SCIP entry for same session.      |
| 17                      | 11                          | 3105       | ISC  | No CNTs on SPQB.                         |
| 18                      | 12                          | 3107       | ISC  | Nonzero CID for existing session.        |

Table 74. Codes related to ISC processing (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                |
|-------------------------|-----------------------------|------------|------|--------------------------------------------|
| 19                      | 13                          | 3111       | ISC  | Session blocked (3STOP).                   |
| 20                      | 14                          | 3111       | ISC  | Session stopped.                           |
| 21                      | 15                          | 3107       | ISC  | Ran out of CLBs.                           |
| 22                      | 16                          | 3101       | ISC  | SPQB CRB pointer = 0.                      |
| 23                      | 17                          | 1916       | ISC  | LOGON, but previous session was secondary. |
| 24                      | 18                          | 1916       | ISC  | SCIP, but previous session was primary.    |
| 25                      | 19                          | 2066       | ISC  | User data length from INQUIRE = 0.         |
| 26                      | 1A                          | 3663       | ISC  | LU type in BIND = '0602' (LU 6.2)          |
| 27                      | 1B                          | 3107       | ISC  | SPQB found but allocated.                  |
| 28                      | 1C                          | 3107       | ISC  | SPQB CRB pointer <> 0.                     |
| 29                      | 1D                          | 3101       | ISC  | Second logon entry for same session.       |

The codes in the following table might occur during ISC BINDRACE processing.

Table 75. Codes related to ISC BINDRACE processing

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                             |
|-------------------------|-----------------------------|------------|------|-----------------------------------------|
| 41                      | 29                          | N/A        | ISC  | SESSIONC not issuable—VTAM terminating. |
| 42                      | 2A                          | N/A        | ISC  | SESSIONC issued.                        |
| 43                      | 2B                          | N/A        | ISC  | SESSIONC not issuable—VTAM terminating. |
| 44                      | 2C                          | N/A        | ISC  | BIND not received.                      |
| 45                      | 2D                          | N/A        | ISC  | SESSIONC issued.                        |

#### Codes related to MSC errors

Codes related to MSC and MSC SCIP errors are listed, including their location codes, DFS message number, exit, and an explanation.

The codes in the following table relate to MSC errors.

Table 76. Codes related to MSC errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                  |
|-------------------------|-----------------------------|------------|------|------------------------------|
| 51                      | 33                          | 3101       | MSC  | CID already present.         |
| 52                      | 34                          | 3213       | MSC  | 3213 message issued. Code=4. |
| 53                      | 35                          | 3213       | MSC  | 3213 message issued. Code=8. |

Table 76. Codes related to MSC errors (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                   |
|-------------------------|-----------------------------|------------|------|-------------------------------|
| 54                      | 36                          | 3213       | MSC  | 3213 message issued. Code=24. |
| 55                      | 37                          | 3213       | MSC  | 3213 message issued. Code=32. |

The codes in the following table relate to MSC SCIP errors.

Table 77. Codes related to MSC SCIP errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation          |
|-------------------------|-----------------------------|------------|------|----------------------|
| 71                      | 47                          | N/A        | MSC  | CID already present. |
| 72                      | 48                          | N/A        | MSC  | No USERFLD provided. |
| 73                      | 49                          | N/A        | MSC  | RPL not initialized. |

### Codes related to dynamic logon

Dynamic login codes, their locations, DFS message number, exit and explanation are listed.

Table 78. Codes related to dynamic logon errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                           |
|-------------------------|-----------------------------|------------|------|-------------------------------------------------------|
| 81                      | 51                          | 2264       | LOG  | Do not accept logons.                                 |
| 82                      | 52                          | 3862       | LOG  | Nonexistent VTCB trying to logon to alternate system. |
| 83                      | 53                          | 2037       | LOG  | /STA DC not done.                                     |
| 84                      | 54                          | 2104       | LOG  | Invalid temporary VTCB exists.                        |
| 85                      | 55                          | 3862       | LOG  | Invalid temporary VTCB exists.                        |
| 86                      | 56                          | 3862       | LOG  | Logon not for XRF link.                               |
| 87                      | 57                          | 3111       | LOG  | Node stopped.                                         |
| 88                      | 58                          | 2264       | LOG  | Logons not accepted and SIMLOG not in effect.         |
| 89                      | 59                          | 3862       | LOG  | In backup but not preopen.                            |
| 90                      | 5A                          | 3862       | LOG  | In backup preopen but backup session not allowed.     |
| 91                      | 5B                          | 2037       | LOG  | /STA DC not done.                                     |
| 92                      | 5C                          | 79         | LOG  | Queues not available.                                 |
| 93                      | 5D                          | 3111       | LOG  | Node not started.                                     |
| 94                      | 5E                          | 79         | LOG  | Shutting down and MTO logging not on.                 |
| 95                      | 5F                          | 3111       | LOG  | Node stopped.                                         |
| 96                      | 60                          | 3101       | LOG  | Node logging off.                                     |



Table 78. Codes related to dynamic logon errors (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                     |
|-------------------------|-----------------------------|------------|------|---------------------------------|
| 97                      | 61                          | 3101       | LOG  | Session terminating.            |
| 98                      | 62                          | 3101       | LOG  | CID already exists.             |
| 99                      | 63                          | 3111       | ISC  | Node stopped on temporary VTCB. |

**Codes related to existing ISC session errors**

ISC session error codes are listed, including their location, DFS message number, exit, and explanation.

Table 79. Codes related to existing ISC session errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                    |
|-------------------------|-----------------------------|------------|------|--------------------------------|
| 111                     | 6F                          | 3645       | ISC  | QSAVE could not be gotten.     |
| 112                     | 70                          | 3645       | ISC  | Parsing failed.                |
| 113                     | 71                          | 3645       | ISC  | Dynamic terminals not allowed. |

**Codes related to user-logon-exit routine processing**

User-logon-exit routine processing codes are listed, including their location, DFS message number, exit, and explanation.

Table 80. Codes related to user-logon exit routine processing

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                     |
|-------------------------|-----------------------------|------------|------|-----------------------------------------------------------------|
| 121                     | 79                          | 3645       | LOG  | Could not get QSAVE for signon parameters.                      |
| 122                     | 7A                          | 3645       | LOG  | Parsing failed.                                                 |
| 123                     | 7B                          | 3645       | LOG  | User logon exit rejected logon.                                 |
| 124                     | 7C                          | 3645       | LOG  | User logon exit rejected logon.                                 |
| 125                     | 7D                          | 3645       | LOG  | Invalid ALOT or ASOT value from user logon exit routine         |
| 126                     | 7E                          | 3645       | N/A  | User logon exit routine erased all descriptors.                 |
| 127                     | 7F                          | 3645       | LOG  | A dynamically created logging-on STSN VCTB must have user data. |
| 128                     | 80                          | 3645       | LOG  | Existing dynamic logging-on STSN VTCB must have user data.      |

### Codes related to logon errors

Logon error codes are listed, with their locations, DFS message number, exit, and explanation.

Table 81. Codes related to logon errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                                                          |
|-------------------------|-----------------------------|------------|------|------------------------------------------------------------------------------------------------------|
| 141                     | 8D                          | 3645       | N/A  | Dynamic terminals not allowed.                                                                       |
| 142                     | 8E                          | 3646       | N/A  | Inconsistent attributes.                                                                             |
| 143                     | 8F                          | 3646       | N/A  | Inconsistent attributes.                                                                             |
| 144                     | 90                          | 3645       | N/A  | Could not get SOPB storage.                                                                          |
| 145                     | 91                          | 3645       | N/A  | Parsing of userdata failed.                                                                          |
| 146                     | 92                          | 3645       | N/A  | Terminal is the primary or secondary master terminal for the alternate system in an XRF environment. |
| 148                     | 94                          | 3644       | N/A  | Could not get SOPB storage.                                                                          |
| 149                     | 95                          | 3644       | N/A  | Could not get SOPB storage.                                                                          |
| 150                     | 96                          | 2066       | LOG  | The LUTYPE in BIND/CINIT conflicts with static ISC block LUTYPE.                                     |
| 161                     | A1                          | 3671       | N/A  | Invalid descriptor specified in userdata.                                                            |
| 162                     | A2                          | 3651       | N/A  | No default descriptor found.                                                                         |
| 163                     | A3                          | 3671       | N/A  | User logon exit routine returned invalid descriptor.                                                 |
| 164                     | A4                          | 3644       | N/A  | Could not get SOPB storage.                                                                          |
| 165                     | A5                          | 3651       | N/A  | No default descriptor found.                                                                         |

### Related reference

[“Qualifier codes” on page 325](#)

Qualifier codes for ETO parsing errors, VTCB creation errors, screen-attribute errors, are listed with their location codes, DFS message number, exit, and explanation.

### Codes related to logon descriptor processing

Logon descriptor processing codes are listed along with their location, DFS message number, exit, and explanation.

Table 82. Codes related to logon descriptor processing

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                                                            |
|-------------------------|-----------------------------|------------|------|--------------------------------------------------------------------------------------------------------|
| 181                     | B5                          | 3663       | LOG  | LU type must be < 7.                                                                                   |
| 182                     | B6                          | 3663       | LOG  | LU type must be >= 0.                                                                                  |
| 183                     | B7                          | 3663       | LOG  | Invalid LU type specified.                                                                             |
| 184                     | B8                          | 3663       | LOG  | Invalidly-specified non-SNA 3270 VTAM device. Make sure mode-table is properly defined and referenced. |

Table 82. Codes related to logon descriptor processing (continued)

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                      |
|-------------------------|-----------------------------|------------|------|----------------------------------|
| 185                     | B9                          | 3663       | LOG  | Invalid LU 1 or NTO device type. |

#### Codes related to logging-on device characteristics

Logging-on device characteristic codes are listed along with their location, DFS message number, exit and explanation.

Table 83. Codes related to logging-on device characteristics

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                           |
|-------------------------|-----------------------------|------------|------|-----------------------------------------------------------------------|
| 191                     | BF                          | 3646       | LOG  | Invalid SLU 1 device logging on.                                      |
| 192                     | C0                          | 3646       | LOG  | Device LU type does not match descriptor.                             |
| 193                     | C1                          | 3646       | LOG  | Non-SNA 3270 VTAM logon descriptor invalid for the logging-on device. |
| 194                     | C2                          | 3646       | LOG  | Invalid SLU P or 3600 type device mismatch with the logon descriptor. |
| 195                     | C3                          | 3646       | LOG  | TS type or LU type mismatch.                                          |

## Qualifier codes

Qualifier codes for ETO parsing errors, VTCB creation errors, screen-attribute errors, are listed with their location codes, DFS message number, exit, and explanation.

#### Codes related to ETO parsing errors

##### Codes related to ETO parsing errors

The Qualifier codes in the following table relate to ETO parsing errors that are associated with message DFS3645I.

Table 84. Qualifier codes related to ETO parsing errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                      |
|-------------------------|-----------------------------|------------|------|------------------------------------------------------------------|
| 1                       | 1                           | N/A        | N/A  | Invalid logon descriptor name—no name specified.                 |
| 2                       | 2                           | N/A        | N/A  | Invalid logon descriptor name—name is greater than 8 characters. |
| 3                       | 3                           | N/A        | N/A  | Invalid logon descriptor name—no name specified.                 |

#### Codes related to VTCB creation errors

##### Codes related to VTCB creation errors

The Qualifier codes in the following table relate to VTCB creation errors that are associated with a DFS3644 message.

Table 85. Qualifier codes related to VTCB creation errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                         |
|-------------------------|-----------------------------|------------|------|-------------------------------------|
| 1                       | 1                           | N/A        | N/A  | QSAVE not gotten.                   |
| 2                       | 2                           | N/A        | N/A  | VTCB could not be created.          |
| 3                       | 3                           | N/A        | N/A  | Could not put VTCB into hash table. |

#### Codes related to screen-attribute errors

#### Codes related to screen-attribute errors

The Qualifier codes in the following table relate to screen-attribute errors (associated with a DFS3646I message).

Table 86. Qualifier codes related to screen-attribute errors

| Location code (decimal) | Location code (hexadecimal) | Msg# (DFS) | Exit | Explanation                                                                                                                                               |
|-------------------------|-----------------------------|------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                       | 1                           | N/A        | N/A  | No Device Characteristics Table. Run the MFS DCT (DFSUTB00) utility.                                                                                      |
| 2                       | 2                           | N/A        | N/A  | No match for screen size and feature. Update MFS DCT (DFSUTB00) for the missing entry.                                                                    |
| 3                       | 3                           | N/A        | N/A  | Screen size control byte incorrectly specified. The byte itself might be invalid. If X'7F' is specified, then a valid screen size must also be specified. |

#### Related reference

“Codes related to logon errors” on page 324

Logon error codes are listed, with their locations, DFS message number, exit, and explanation.

## IDCO trace table entries

IDCO trace table entries, including error messages issued by DFSCNXA0 are listed along with the codes and DFS message number.

#### Error messages issued by DFSCNXA0

#### Error messages issued by DFSCNXA0

The following table shows codes that identify error messages that are issued by DFSCNXA0. The code is placed in the MsgID field of an IDCO trace entry.

Table 87. Codes that identify error messages issued by DFSCNXA0

| Code (decimal) | Code (hexadecimal) | Msg# (DFS) |
|----------------|--------------------|------------|
| 0              | 00                 | 2104       |
| 4              | 04                 | 3111       |
| 8              | 08                 | 2037       |
| 12             | 0C                 | 79         |
| 16             | 10                 | 1915       |

Table 87. Codes that identify error messages issued by DFSCNXA0 (continued)

| Code (decimal) | Code (hexadecimal) | Msg# (DFS) |
|----------------|--------------------|------------|
| 20             | 14                 | 1917       |
| 24             | 18                 | 1931       |
| 28             | 1C                 | 3862       |
| 32             | 20                 | 970        |
| 36             | 24                 | 1916       |
| 40             | 28                 | 1914       |
| 44             | 2C                 | 2066       |
| 48             | 30                 | 3107       |
| 52             | 34                 | 3105       |
| 56             | 38                 | 3101       |
| 60             | 3C                 | N/A        |
| 64             | 40                 | 2049       |
| 68             | 44                 | 3213       |
| 72             | 48                 | 2264       |
| 76             | 4C                 | 3644       |
| 80             | 50                 | 3645       |
| 84             | 54                 | 3646       |
| 88             | 58                 | 3651       |
| 92             | 5C                 | 3663       |
| 96             | 60                 | N/A        |
| 100            | 64                 | 3671       |
| 104            | 68                 | 2061       |

The following internal trace formats map IDC0 trace table entries:

**Format 1 (IDC0)**

**XL1**

Function Code = X'B8' (set by 'DFSTRACE')

**XL1**

Subcode

**XL2**

Unusable

**XL1**

RPLRTNCD - RPL return code

**XL1**

RPLFDB2 - RPL feedback

**XL1**

Reserved

**XL1**

Error type  
X'80' = 2061 error  
X'40' = 2062 error  
X'20' = 970 error

**CL8**

Nodename

**CL8**

Mode-table entry name

**CL8**

Applid (if applicable)  
or

**CL8**

Time stamp

**Format 2 (CNXA)**

One event can span two entries.

**First Entry****XL1**

Function Code = X'B9' (set by 'DFSTRACE')

**XL1**

Subcode

**XL2**

Unusable

**XL1**

VTAM-exit indicator

00 --> You are looking at the '2nd' entry  
04 --> LOGON EXIT ENTERED  
08 --> SCIP EXIT ENTERED  
0C --> NSEXIT EXIT ENTERED  
10 --> LOSTERM EXIT ENTERED  
14 --> RELREQ EXIT ENTERED

**XL1**

Error location code

**XL1**

Location code qualifier

**XL1**

Processing flag at error time

80 VTCB LATCH HELD  
40 LOGON DESCRIPTOR NAME IN CINIT/BIND  
20 VTCB DOES NOT YET EXIST  
10 VTCB ATTEMPTING CONNECTION FOUND  
08 SPQB FOUND  
04 IMS CORRELATION ID IN USERDATA  
02 ISC PROCESSING ENTERED  
01 EXISTING VTCB IN LOGOFF PROCESS

**CL8**

Nodename

- XL4**  
LOSTERM reason code
- XL4**  
CLB address
- XL4**  
CID
- XL1**  
LU type
- XL1**  
TS profile
- XL1**  
MSG ID of error message
- XL1**  
Reserved

**2nd entry (in the case of LOGON or SCIP exits being driven)**

- XL1**  
Function Code = X'B9' (set by 'DFSTRACE')
- XL1**  
Subcode
- XL2**  
Unusable
- XL4**  
Reserved
- CL8**  
Nodename
- CL8**  
Descriptor name or subpool name
- XL8**  
Time stamp

## APPC/IMS diagnostic aids

---

APPC/IMS diagnostic aids include LU manager trace, LU 6.2 module-to-code cross references, APPC/MVS verb-to-code cross references, DDFS1959e message information, diagnostic information for APP and OTMA with shared queues, and information on SNAPs and dumps.

### LU manager trace

The LU manager trace records the flow of control through the IMS LU 6.2 components. Analyzing the trace entries together with the MVS/ESA APPC trace entries is useful in determining the problem.

#### Starting the LU manager trace

The **/TRACE SET ON TABLE LUMI** command activates the trace and sends the entries to an internal table.

You can format the table using the Offline Dump Formatter under IPCS, using either the VERBX command or the IMS Dump Formatter panels.

If a SNAP dump is taken, the table is formatted as part of the IMS dump.

If you add the OPTION LOG parameter to the **/TRACE** command, IMS sends the output to an external data set. You can use the File Select and Formatting utility (DFSERA10) with exit DFSERA60 to format the trace entries.

## Related concepts

“Formatting IMS dumps offline” on page 560

Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

## Formatting the LU manager trace

The general format of an LU manager trace record is shown. Each record is 8 words long. Word 0 holds standard information for each record.

## LU manager trace record format

Table 88. LU manager trace record format

| WORD 0 |         | WORD 1 | WORD 2 | WORD 3 | WORD 4 | WORD 5 | WORD 6 | WORD 7 |
|--------|---------|--------|--------|--------|--------|--------|--------|--------|
| ID     | SEQ NUM |        |        |        |        |        |        |        |

where

**represents**

### ID

Two-byte trace ID.

### SEQ NUM

Two-byte trace sequence number assigned by the IMS trace component.

Words 1 thru 7 contain data specific to each trace entry, as described below:

**TRACE ID = X'7B01'** LUM module entry

#### Word 1

**byte 0:**Module number **bytes 1-3:** Reserved

#### Word 2

A(ECB)

#### Word 3

Register 1

#### Words 4-5

Optional user data

#### Words 6-7

Time stamp (STCK)

**TRACE ID = X'7B02'** LUM module exit

#### Word 1

**byte 0:**Module number **bytes 1-3:** Reserved

#### Word 2

A(ECB)

#### Word 3

Return code

#### Words 4-5

Optional user data

#### Words 6-7

Time stamp (STCK)

**TRACE ID = X'7B03'** IMS internal LUM error

#### Word 1

**byte 0:**Module number **bytes 1-3:** 0



**Word 2**

Error code

**Word 3**

TIB address

**Word 4**

TIB prefix address

**Word 5**

0

**Words 6-7**

Time stamp (STCK)

**TRACE ID = X'7B04' IMS APPC Status Change****Word 1**

- **byte 0:** Module number
- **byte 1:** AWE function requested code
  - **X'01':** Initialization request
  - **X'02':** Dependent region connected
  - **X'03':** Start APPC
  - **X'04':** Stop APPC
  - **X'05':** Purge APPC
  - **X'06':** Cancel APPC
  - **X'07':** Terminate APPC
  - **X'08':** Attach request
  - **X'09':** APPC initialized
  - **X'0A':** APPC stopped
  - **X'0B':** LU activated
  - **X'0C':** LU deactivated
  - **X'0D':** XRF takeover
  - **X'0E':** Clear TIBs
  - **X'0F':** Build LU6.2 descriptors
- **byte 2:** Current APPC status
  - **X'C1':** Starting
  - **X'C3':** Cancelled
  - **X'C4':** Disabled
  - **X'C5':** Enabled
  - **X'C6':** Failed
  - **X'D6':** Outbound
  - **X'D7':** Purging
  - **X'E2':** Stopped
- **byte 3:** Desired/requested APPC status
  - **X'C1':** Starting
  - **X'C3':** Cancelled
  - **X'C4':** Disabled
  - **X'C5':** Enabled
  - **X'C6':** Failed

- **X'D6'**:Outbound
- **X'D7'**:Purging
- **X'E2'**:Stopped

**Word 2**

A(ECB)

**Word 3**

- **byte 0:** Last APPC status
  - **X'C1'**:Starting
  - **X'C3'**:Cancelled
  - **X'C4'**:Disabled
  - **X'C5'**:Enabled
  - **X'C6'**:Failed
  - **X'D6'**:Outbound
  - **X'D7'**:Purging
  - **X'E2'**:Stopped
- **byte 1:** Last Desired/requested APPC status
  - **X'C1'**:Starting
  - **X'C3'**:Cancelled
  - **X'C4'**:Disabled
  - **X'C5'**:Enabled
  - **X'C6'**:Failed
  - **X'D6'**:Outbound
  - **X'D7'**:Purging
  - **X'E2'**:Stopped
- **bytes 2-3:** 0

**Word 4**

0

**Word 5**

0

**Words 6-7**

Time stamp (STCK)

**TRACE ID = X'7B05'** LUM module IWAIT

**Word 1**

**byte 0:**Module number **bytes 1-3:** Reserved

**Word 2**

A(ECB)

**Word 3**

TIB\_SYNC\_PTR

**Words 4**

A(TIB)

**Words 5**

0

**Words 6-7**

Time stamp (STCK)

**TRACE ID = X'7B06'** LUM module IPOST

**Word 1**

**byte 0:**Module number **bytes 1-3:** 0

**Word 2**

A(ECB)

**Word 3**

TIB\_SYNC\_PTR

**Words 4**

A(TIB)

**Words 5**

0

**Words 6–7**

Time stamp (STCK)

**TRACE ID = X'7B07'** z/OS cross-system coupling facility sendmsg

**Word 1**

- **Byte 0:** Module number - see [Table 89 on page 338](#)
- **Bytes 2-3:** Function Return Code

**Word 2**

A(TIB)

**Words 3-6**

TIB MSG PREFIX URTOKEN

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7B08'** AWE server TIB POST

**Word 1**

- **Byte 0:** Module number - see [Table 89 on page 338](#)
- **Bytes 2-3:** Return code

**Word 2**

A(ECB)

**Word 3**

AOS POST CODE

**Word 4**

A(TIB)

**TRACE ID = X'7B09'** Request sent to z/OS Resource Recovery Services AWE server

**Word 1**

- **Byte 0:** Module number - see [Table 89 on page 338](#)
- **Bytes 2-3:** AWRRFUNC

**Word 2**

A(ECB)

**Word 3**

AOS POST CODE

**Words 4–7**

MSG PREFIX URTOKEN

**TRACE ID = X'7C01'** Normal return from APPC/MVS

**Word 1**

- **byte 0:** Module number - See [Table 89 on page 338](#).

- **byte 1:** ATB call number - See Table 90 on page 340.
- **byte 2:** ATB flags
  - **bit 0:** Verb issued for asynchronous processing
  - **bit 1:** Return code is from asynchronous processing
  - **bit 2:** CID given and all zeros
  - **bit 3:** TPID field has user data
  - **bit 4:** CID field has user data
- **byte 3:** Optional user data

**Words 2-3**

TPID or user data

**Words 4-5**

CID or user data

**Word 6**

Return code

**Word 7**

A(ECB)

**TRACE ID = X'7C02'** Unexpected return code from APPC/MVS

**Word 1**

- **byte 0:** Module number
- **byte 1:** ATB call number
- **byte 2:** ATB flags
  - **bit 0:** Verb issued for asynchronous processing
  - **bit 1:** Return code is from asynchronous processing
  - **bit 2:** CID given and all zeros
  - **bit 3:** TPID field has user data
  - **bit 4:** CID field has user data
- **byte 3:** Optional user data

**Words 2-3**

TPID or user data

**Words 4-5**

CID or user data

**Word 6**

Return code

**Word 7**

A(ECB)

**TRACE ID = X'7C03'** APPC/MVS asynchronous verb entry

**Word 1**

- **byte 0:** Module number
- **byte 1:** ATB call number
- **byte 2:** ATB flags
  - **bit 0:** Verb issued for asynchronous processing
  - **bit 1:** Return code is from asynchronous processing
  - **bit 2:** CID given and all zeros
  - **bit 3:** TPID field has user data

- **bit 4:** CID field has user data
- **byte 3:** Optional user data

**Words 2-3**

TPID or user data

**Words 4-5**

CID or user data

**Word 6**

Reserved (FFFFFFFF)

**Word 7**

A(ECB)

**TRACE ID = X'7F01'** APPC Attach from APPC/MVS

**Word 1**

Reserved

**Word 2**

XCF message type

**Words 3-4**

TPID for XCF message

**Words 5-6**

Local LU to which ATTACH request was directed

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F02'** IMS LU activating or deactivating

**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

XCF message LU flags **bit 0:** LU is base LU

**Words 4-5**

LU name

**Word 6**

0

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F03'** APPC/MVS starting or stopping

**Word 1**

Reserved

**Word 2**

XCF message type

**Words 3-6**

0

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F04'** CPOOL storage shortage

**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

XCF message length

**Words 4-5**

TPID from XCF message

**Word 6**

0

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F05'** CPOOL block too small for XCF message

**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

XCF message length

**Word 4**

Cell size

**Words 4-5**

TPID from XCF message

**Word 6**

0

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F06'** Invalid request from XCF

**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

0

**Words 4-5**

MEPLSRCE map

**Word 6**

0

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F07'** APPC/MVS not enabled for Attach

**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

- **byte 0:** LSCD status (disabled, failed, stopped)
- **byte 1:** LSCD IN flags (LSCD - APPC/IMS global control block)
- **byte 2:** LSCD OUT flags
- **byte 3:** LSCD flags

**Word 4**

0

**Words 5-6**

TPID from XCF message

**Word 7**

Time stamp (STCK)

**TRACE ID = X'7F09'** TP deallocate failed**Word 1**

Reserved

**Word 2**

XCF message type

**Word 3**

Return code

**Words 4-6**

0

**Word 7**

Time stamp (STCK)

**LU manager trace example**

The following LU manager trace example shows calls to DFS62FD0 caused by **/DISPLAY** commands, a clean address space caused by a non-LU 6.2 transaction ending, and a synchronous LU 6.2 transaction being executed.

**LU manager trace example**

The trace has been formatted by the File Select and Formatting utility (DFSERA10) with exit DFSERA60, which places the module number after word 7.

```

OPTION PRINT 0=5,V=67FA,EXITR=DFSERA60
END
FUNCTION
* LU1 TRACE TABLE - DATE 91323 TIME 11323667 SKIP 0000 TOTAL SKIP 00000000 RECORD NUMBER 00000167
Module Exit 7B023DD8 20000000 03080330 00000004 10800000 00000000 A4D224D2 27C7AB05 32
Module Exit 7B023E22 20000000 03080330 00000004 10800000 00000000 A4D224D2 34020504 32
Module Exit 7B023E2B 20000000 03080330 00000004 10400000 00000000 A4D224D2 340ACC04 32
Module Entry 7B01554C 0B000000 028E0060 02942244 00020080 00000000 A4D22B41 9C54DB04 11
APPC/MVS Exit 7C01554F 0B120000 FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF 00000004 028E0060 11-
ATBCMAS
Module Exit 7B025552 0B000000 028E0060 00000000 00000000 00000000 A4D22B41 9C5EEA04 11
APPC ATTACH 7F01AC63 00000000 00000001 037AE648 00000002 D3F6F2C9 D4E2F140 48CE0D51
Module Exit 7B02AC8D 20000000 02D02020 00000000 40100000 0310E2B0 A4D24448 CEE7BE05 32
Module Entry 7B01AC97 06000000 0310E2B0 0294D538 00000000 00000000 A4D24448 CEF77405 06
Module Entry 7B01AC9C 10000000 0310E2B0 03036334 01000000 0310E5B2 A4D24448 CF163105 16
Module Exit 7B02AC9D 10000000 0310E2B0 00000000 404008C1 00000000 A4D24448 CF169505 16
Module Entry 7B01ACA2 10000000 0310E2B0 03036334 04020000 0310E5B2 A4D24448 CF1AA305 16
Module Exit 7B02ACA3 10000000 0310E2B0 00000000 404008C1 00000000 A4D24448 CF1B0905 16
APPC/MVS Entry 7C03ACA8 060D8040 037AE648 00000002 037B6018 00000002 FFFFFFFF 0310E2B0 06-
ATBRVCW
APPC/MVS Exit 7C01ACB0 060DC000 037AE648 00000002 037B6018 00000002 00000000 0310E2B0 06-
ATBRVCW
APPC/MVS Entry 7C03ACB7 060D8040 037AE648 00000002 037B6018 00000002 FFFFFFFF 0310E2B0 06-
ATBRVCW
APPC/MVS Exit 7C01ACBF 060DC001 037AE648 00000002 037B6018 00000002 00000000 0310E2B0 06-
ATBRVCW
Module Entry 7B01ACC4 22000000 0310E2B0 03035E98 C1D7D6D3 F1F14040 A4D24448 E8BD6C05 34
Module Exit 7B02ACC5 22000000 0310E2B0 00000000 00000000 00140014 A4D24448 E8C11D05 34
Module Exit 7B02ACEF 06000000 0310E2B0 00000000 00000000 00000000 A4D24448 E9427C05 06
Module Entry 7B01AD41 0A000000 028E0060 02942C78 80000080 028E00F8 A4D24448 F43CDC04 10
Module Exit 7B02AD48 20000000 028E0060 00000000 00100000 0310E2B0 A4D24448 F44ABE04 32
Module Exit 7B02AD4B 0A000000 028E0060 00000000 028E00F8 028E00AC A4D24448 F44D9404 10
APPC/MVS Exit 7C01AD59 3E110000 037AE648 00000002 00000000 00000000 00000000 028E0060 62-
ATBASOC
Module Entry 7B01AD5B 10000000 028E0060 02938040 01000000 02CF9AFE A4D24448 F9BF9F04 16
Module Exit 7B02AD5C 10000000 028E0060 00000000 00000000 00000000 A4D24448 F9C01704 16
Module Entry 7B01AD78 0A000000 028E0060 02942240 00800080 028E00F8 A4D24449 5C418704 10
Module Entry 7B01AD7B 01000000 028E0060 02B921A8 80000000 028E00EC A4D24449 5C4E4D04 01

```

```

Module Entry 7B01AD9A 22000000 028E0060 02B929C0 C1D7D6D3 F1F14040 A4D24449 5D101404 34
Module Exit 7B02AD9B 22000000 028E0060 00000000 04000000 00270027 A4D24449 5D10D104 34
APPC/MVS Entry 7C03ADA0 010F8000 037AE648 00000002 037B6018 00000002 FFFFFFFF 028E0060 01-
ATBSEND
APPC/MVS Exit 7C01ADA8 010FC000 037AE648 00000002 037B6018 00000002 00000000 028E0060 01-
ATBSEND
Module Entry 7B01ADAD 22000000 028E0060 02B929C0 C1D7D6D3 F1F14040 A4D24449 5E1F7B04 34
Module Exit 7B02ADAE 22000000 028E0060 00000000 04000000 00260026 A4D24449 5E202704 34
APPC/MVS Entry 7C03ADB3 010F8000 037AE648 00000002 037B6018 00000002 FFFFFFFF 028E0060 01-
ATBSEND
APPC/MVS Exit 7C01ADBB 010FC000 037AE648 00000002 037B6018 00000002 00000000 028E0060 01-
ATBSEND
APPC/MVS Entry 7C03ADC0 01068000 037AE648 00000002 037B6018 00000002 FFFFFFFF 028E0060 01-
ATBFLUS
APPC/MVS Exit 7C01ADC8 0106C000 037AE648 00000002 037B6018 00000002 00000000 028E0060 01-
ATBFLUS
Module Exit 7B02ADDB 01000000 028E0060 00000000 00010000 00000000 A4D24449 5E828004 01
Module Exit 7B02ADDE 0A000000 028E0060 00000000 028E00F8 00000000 A4D24449 5E855A04 10
Module Entry 7B01ADEC 0B000000 028E0060 02942240 00400080 028E00F8 A4D24449 5E9D0E04 11
Module Exit 7B02ADED 0B000000 028E0060 00000000 028E00F8 00000000 A4D24449 5E9E4C04 11
Module Entry 7B01ADF8 0A000000 028E0060 02942240 00040080 00000000 A4D24449 5EAAA104 10
Module Exit 7B02ADF9 0A000000 028E0060 00000000 00000000 028E00AC A4D24449 5EABB204 10
Module Entry 7B01AE09 0A000000 028E0060 02942240 00200080 028E00F8 A4D24449 5E48D004 10
APPC/MVS Entry 7C03AE0C 0A048000 037AE648 00000002 037B6018 00000002 FFFFFFFF 028E0060 10-
ATBDEAL
APPC/MVS Exit 7C01AE14 0A04E000 037AE648 00000002 037B6018 00000002 00000000 028E0060 10-
ATBDEAL
Module Exit 7B02AE19 20000000 028E0060 00000000 80100000 00000000 A4D24449 5EF81604 32
Module Exit 7B02AE1C 0A000000 028E0060 00000000 028E00F8 00000000 A4D24449 5F104504 10
Module Entry 7B01AE3F 0B000000 028E0060 02942244 00020080 00000000 A4D24449 5F2BD704 11
APPC/MVS Exit 7C01AE42 0B150000 037AE648 00000002 FFFFFFFF FFFFFFFF 00000004 028E0060 11-
ATBCMTP
Module Exit 7B02AE45 0B000000 028E0060 00000000 00000000 00000000 A4D24449 D2E40205 11
Module Entry 7B01AE5A 0B000000 028E0060 02942244 00020080 00000000 A4D24449 D5D0AD05 11
APPC/MVS Exit 7C01AE5D 0B120000 FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF 00000004 028E0060 11-
ATBCMAS
Module Exit 7B02AE60 0B000000 028E0060 00000000 00000000 00000000 A4D24449 D5DB1205 11
DFS707I END OF FILE ON INPUT
DFS708I OPTION COMPLETE
DFS703I END OF JOB

```

## LU 6.2 module-to-code cross-reference table

You can use the module number, module name, and description to associate code xx in message DFS1959E and the module number in trace records X'7Bxx' and X'7Cxx' with a module.

Table 89. LU 6.2 module-to-code cross-reference table

| Module number (decimal) | Module number (hexadecimal) | Module   | Description                      |
|-------------------------|-----------------------------|----------|----------------------------------|
| 01                      | 01                          | DFSSLUM0 | Synchronous output LU manager    |
| 02                      | 02                          | DFSAPPC0 | DFSAPPC message switch processor |
| 03                      | 03                          | DFSCMD00 | LU 6.2 command interface         |
| 04                      | 04                          | DFSALM00 | Asynchronous output LU manager   |
| 05                      | 05                          | DFSRLM00 | Receive LU manager server        |
| 06                      | 06                          | DFSRLM10 | Receive LU manager receiver      |
| 08                      | 08                          | DFSAPP10 | DFSAPPC keyword parser           |
| 09                      | 09                          | DFSATB00 | APPC/MVS verb execution/trace    |
| 10                      | 0A                          | DFS6LUS0 | LU 6.2 services interface 1      |
| 11                      | 0B                          | DFS6LUS1 | LU 6.2 services interface 2      |
| 12                      | 0C                          | DFS6LUS2 | LU 6.2 services interface 3      |
| 16                      | 10                          | DFSRAC60 | RACF interface module            |



Table 89. LU 6.2 module-to-code cross-reference table (continued)

| Module number (decimal) | Module number (hexadecimal) | Module   | Description                                                     |
|-------------------------|-----------------------------|----------|-----------------------------------------------------------------|
| 21                      | 15                          | DFS6RST0 | LU 6.2 restart processor                                        |
| 22                      | 16                          | DFS6CKP0 | LU 6.2 checkpoint processor                                     |
| 24                      | 18                          | DFSGIDC0 | Read and build LU 6.2 descriptors                               |
| 31                      | 1F                          | DFS6ECT0 | LU 6.2 z/OS cross-system coupling facility message processor    |
| 32                      | 20                          | DFS62FD0 | LU 6.2 Find destination routine (QABs/TIBs)                     |
| 33                      | 21                          | DFSLUDIO | LU 6.2 User Destination exit                                    |
| 34                      | 22                          | DFSLIEE0 | LU 6.2 User Data Edit exit                                      |
| 35                      | 23                          | DFSHCI00 | XRF takeover processing                                         |
| 36                      | 24                          | DFS6QFX0 | LU 6.2 Nonrecoverable message cleanup                           |
| 37                      | 25                          | DFSHAV70 | XRF termination/takeover                                        |
| 38                      | 26                          | DFS62FD1 | LU 6.2 Find destination routine (LUBs/DESCs)                    |
| 40                      | 28                          | DFSCMLC0 | MSC SQ APPC/OTMA Message Router                                 |
| 41                      | 29                          | DFSCMS00 | MS Analyzer                                                     |
| 50                      | 32                          | DFSXLUM0 | LUM TCB Initialization routine                                  |
| 51                      | 33                          | DFSYIOE0 | OTMA Input and Output user exit                                 |
| 52                      | 34                          | DFSXXCF0 | XCF TCB initialization                                          |
| 53                      | 35                          | DFSXRM00 | RLUM TCB initialization                                         |
| 54                      | 36                          | DFSXALM0 | ALUM TCB initialization                                         |
| 55                      | 37                          | DFSXALC0 | ALUM allocate TCB initialization                                |
| 56                      | 38                          | DFSFLUM0 | LUM TCB ESTAE routine                                           |
| 60                      | 3C                          | DFSICM20 | LU 6.2 command processor                                        |
| 61                      | 3D                          | DFSTMR00 | TM ABEND retry eligibility module                               |
| 62                      | 3E                          | DFSTMAS0 | TM ASSOCIATE TPI and create accessor environment element (ACEE) |
| 63                      | 3F                          | DFSTMCD0 | CONNECT/DISCONNECT support                                      |
| 71                      | 47                          | DFSAOSW0 | APPC/OTMA SMQ AWE server                                        |
| 72                      | 48                          | DFSRGFS0 | z/OS Resource Recovery Services Server, AWE PROCESSOR           |
| 90                      | 5A                          | DFSXAOS0 | DFSXAOS0 APPC/OTMA SMQ Enablement Initialization                |

**Related reference**

[“DFS1959E message information” on page 341](#)

APPC/IMS issues message DFS1959E when a severe internal error occurs.

## APPC/MVS verb-to-code cross-reference table

You can use the verb number, verb name, and verb description to associate the ATB call number in trace records X'7Cxx' with an APPC/MVS verb.

Table 90. APPC/MVS verb-to-code cross-reference table

| Verb number<br>(hexadecimal) | Verb name | Verb description                                       |
|------------------------------|-----------|--------------------------------------------------------|
| 01                           | ATBALLC   | Allocate a conversation                                |
| 02                           | ATBCFM    | Send a confirmation request                            |
| 03                           | ATBCFMD   | Send a confirmation reply                              |
| 04                           | ATBDEAL   | Deallocate a conversation.                             |
| 05                           | ATBDFTP   | Define TPID                                            |
| 06                           | ATBFLUS   | Empty the local LU's send buffer                       |
| 07                           | ATBGTA2   | Get conversation attributes                            |
| 08                           | ATBGETC   | Accept conversation                                    |
| 09                           | ATBGETP   | Get TP properties                                      |
| 0A                           | ATBGETT   | Get conversation type                                  |
| 0B                           | ATBPTR    | Enter receive state                                    |
| 0C                           | ATBRCVI   | Receive data, if available                             |
| 0D                           | ATBRCVW   | Wait to receive data                                   |
| 0E                           | ATBRTS    | Enter send state                                       |
| 0F                           | ATBSEND   | Send data                                              |
| 10                           | ATBSERR   | Send error                                             |
| 11                           | ATBASOC   | Associate TPID                                         |
| 12                           | ATBCMAS   | Clean address space                                    |
| 13                           | ATBMIGRP  | Join z/OS cross-system coupling facility message group |
| 14                           | ATBSASA   | Set address space attributes                           |
| 15                           | ATBCMTP   | Clean TPID                                             |
| 16                           | ATBCNTL   | APPC/MVS control call                                  |
| 17                           | ATBCONN   | Connect address space to scheduler                     |
| 18                           | ATBDCON   | Disconnect address space from scheduler                |
| 19                           | ATBEXAI   | Extract conversation information                       |
| 1A                           | ATBIDEN   | Identify scheduler to APPC/MVS                         |
| 1B                           | ATBUNID   | Unidentify scheduler from APPC/MVS                     |
| 1C                           | ATBIDN4   | Identify scheduler to APPC/MVS                         |
| 1D                           | ATBUID4   | Unidentify scheduler from APPC/MVS                     |
| 1E                           | ATBVERS   | Version service                                        |

Table 90. APPC/MVS verb-to-code cross-reference table (continued)

| Verb number<br>(hexadecimal) | Verb name | Verb description        |
|------------------------------|-----------|-------------------------|
| 1F                           | ATBALC5   | Allocate a conversation |
| 20                           | ATBSTO5   | Set timeout value       |
| 21                           | ATBLEAVE  | Leave XCF message group |

## DFS1959E message information

APPC/IMS issues message DFS1959E when a severe internal error occurs.

The message format is:

```
DFS1959E SEVERE IMS INTERNAL FAILURE, REASON CODE=xxyy
```

Variable xx is a decimal number that identifies the module. . Variable yy is an internal reason code.

If you receive this message, contact IBM Software Support with the module number and reason code supplied in the message, and, if requested, output from the LU manager trace.

The following lists provide an explanation of the reason codes listed in the DFS1959E message. Contact IBM Software Support for actions to take in response to these IMS internal failures.

The following two reason codes are module INDEPENDENT. xx denotes the specific IMS module performing the macro call:

### RC

#### Description

#### xx98

Failure in DFSPPOOL to acquire storage for PL/AS variables using the DFSLUMGT macro.

#### xx99

Failure in DFSPPOOL to release storage for PL/AS variables using the DFSLUMRL macro.

### Related reference

“LU 6.2 module-to-code cross-reference table” on page 338

You can use the module number, module name, and description to associate code xx in message DFS1959E and the module number in trace records X'7Bxx' and X'7Cxx' with a module.

### DFSALM00

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSALM00 are given. The DFSALM00 reason code is module dependent.

### RC

#### Description

#### 0401

Failure to clear asynchronous control block work pending bit.

#### 0402

Failure to get LUMP pool buffer using DFSPPOOL macro.

#### 0403

Failure to free LUMP pool buffer using DFSPPOOL macro.

#### 0408

Missing LUNAME from LU 6.2 message prefix.

#### 0409

Missing TPNAME from LU 6.2 message prefix.

**0410**

Unsupported sync level specified in asynchronous control block or LU 6.2 message prefix.

**0411**

Invalid conversation type specified in asynchronous control block or LU 6.2 message prefix.

**0412**

Invalid control data in message segment from GU call.

**0413**

Invalid control data in message segment from GN call.

**0414**

No data, redundant DFSQMGR Get Next call. RC=4.

**0415**

Unknown return code on DFSQMGR Get Next call.

**0416**

Missing LU 6.2 prefix on DFSQMGR Get Unique call.

**0417**

Queue already in read status on DFSQMGR Get Unique call. RC >= X'C'.

**0418**

Failure to dequeue output message. "No message on queue status" is indicated. DFSQMGR Dequeue call, RC=8.

**0419**

Unknown return code from dequeue call. DFSQMGR Dequeue call, RC is other than 0 or 8.

**0421**

Unknown return code from DFSLIEE0 LU 6.2 user edit exit. RC is other than 0, 4, or 8.

**DFSAOSW0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSAOSW0 are given.

**RC****Description****7101**

Unknown request code.

**7109**

Zero TIB address for send output.

**7110**

Failure in QUERY of DFSXCF macro.

**7116**

Zero header address for send output.

**7121**

Failure to get AWE storage using DFSBCB macro.

**7133**

Transaction not found for notify.

**7134**

Other than transaction found for notify.

**7136**

Wrong message number in SEND DFS MESSAGE function.

**7144**

z/OS cross-system coupling facility parameter length too large.

**7144**

Unknown subfunction for Common XCF Communications.

**7150**

Failure to get LUMP storage using DFSPPOOL macro.

**7190**

Failure in QUERY in DFSXCF macro.

**DFSAPPC0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

Reason codes for message DFSAPPC0 are given.

**RC****Description****0201**

DFSQMGR Get Unique call failure, RC not 0.

**0202**

DFSQMGR Get Next call failure, RC not 0 and QTP1EOM=0.

**0203**

DFSQMGR Enqueue call failure, RC not 0.

**0204**

DFSQMGR Dequeue call failure, RC not 0.

**0205**

DFSQMGR Insert Move call failure, RC not 0.

**0206**

DFSQMGR Insert Move call failure, RC not 0.

**0207**

DFSQMGR Cancel Input call failure, RC not 0.

**0208**

Failure to read DFSAPPC message from shared queues.

**0209**

DFSQMGR Insert Move without LU62 MSG PREFIX call failure, RC not 0.

**0210**

DFSQMGR Get Next call failure, RC not 0 and QTP1EOM=0.

**0211**

DFSQMGR Get Next call failure, RC not 0.

**0212**

DFSQMGR Get Unique call failure, RC not 0.

**0250**

Failure to find or create asynchronous control block.

**0260**

Router call failure. DFSICLR0 call, RC not 0.

**0270**

DFSUSE FUNC=NOUSE call failure, RC not 0.

**DFSATB00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

Reason codes for message DFSATB00 are given.

**RC****Description****0901**

Calling module requesting unsupported APPC/MVS verb name.

**DFSCMD00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSCMD00 are given.

**RC****Description****0301**

DFSQMGR Get Unique call failure, RC not 0.

**0302**

DFSQMGR Get Next call failure, RC not 0.

**0304**

DFSQMGR Dequeue call failure, RC not 0.

**0306**

DFSQMGR Insert Locate call failure, RC not 0.

**0321**

Failure to get LUMP pool buffer using DFSPPOOL macro.

**0322**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**DFSCMLC0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSCMLC0 are given.

**RC****Description****4001**

Failure in LUMIF GU call through DFSCMAP0. Type 6701-MSS1/MSS2 records were logged.

**4002**

Failure in processing a remote keyed message. Type 6701-MSS1/MSS2 records were logged.

**4003**

Failure in an INSERT call. Type 6701-MSS1/MSS2 records were logged.

**4004**

Failure in DFSICLR0 message router. Type 6701-MSS1/MSS2 records were logged.

**4005**

DFSCONDO was called to process an error scratchpad area segment for a APPC or OTMA client in conversation mode and an error (RC=08) was returned. Type 6701-MSS1/MSS records were logged.

**4006**

Conversation scratch pad (SPA) message did not have the correct SPA message flags in the message prefix MSGMSFL1 and MSGMSFL2 flags. Type 6701-MSS1/MSS2 records were logged.

**4007**

DFSCONMO was called to process a normal scratch pad segment for a APPC or OTMA client in conversation mode and an error (RC=0C) was returned. Type 6701-MSS1/MSS2 records were logged.

**DFSCMS00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSCMS00 are given.

**RC****Description****4101**

Failure in LUMIF GU call using DFSCMAP0.

**4102**

Failure in LUMIF GU call using DFSCMAP0.

**4103**

Failure in LUMIF GU call using DFSCMAP0.

**DFSHCI00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

Reason codes for message DFSHCI00 are given.

**RC****Description****3501**

Failure to get AWE storage using DFSBCB.

**DFSRLM00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

Reason codes for message DFSRLM00 are given.

**RC****Description****0501**

AWE extension not a FMH5 Attach request.

**0502**

Synchronous control block creation failure using DFS62DST FUNC=FINDD. This could be storage related.

**0503**

Error freeing XAWE. Unknown storage pool.

**0504**

Error freeing XAWE using STORAGE macro.

**0505**

AWE not an FMH5 Attach request.

**0506**

Error posting DFSRLM10 using DFSSERVER macro.

**0507**

Failure in Identify Protected Conversation Context.

**0508**

Blank or zero LUNAME received

**DFSRLM10**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

Reason codes for message DFSRLM10 are given.

**RC****Description****0601**

Failure in DFS62FD0 releasing a synchronous control block (DFS62DST FUNC=RELEASE).

**0602**

Failure in DFSICLF0 FindDest routine looking up trancode. RC >= X'10'.

**0603**

Failure in DFSRAC60. DFSRAC6 FUNC=RACINIT RC not 0.

**0604**

Failure in DFSRAC60. DFSRAC6 FUNC=FRACHECK RC >= X'44'.

**0605**

Failure in DFSTM0 building a CPI-C dynamic SMB RC not 0.

**0606**

Failure in DFSICLR0 message router. Enqueue to SMB RC not 0.

**0607**

Failure to get LUMP pool buffer using DFSPPOOL macro.

**0608**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**0609**

Failure in DFSQMGR updating message to nonrecoverable RC not 0.

**0610**

Failure in DFSTM0 to ENQ prefix to CPIC dynamic SMB RC not 0.

**0611**

Failure in DFSQMGR to insert Data for SMB or DFSAPPC DFSQMGR Insert Move call failure, RC not 0.

**0612**

Failure in DFSCMD00 processing IMS command. RC not 0.

**0613**

Failure in DFSAPPC0 processing Message Switch RC not 0.

**0614**

Failure in DFSQMGR to cancel a message in progress. RC not 0.

**0615**

Failure in DFSQMGR to enqueue message for Cmd or DFSAPPC. RC not 0.

**0616**

Failure in DFSQMGR to update APPC Message Prefix. RC not 0.

**0617**

Failure in DFSHEILO unrecognized return code from Fast Path RC other than 0, 4, 8, or 12.

**0618**

Failure in DFSBCB to free AWE.

**0619**

Failure in DFS6LUS0 RLUM reposted and not running conversational transaction.

**0620**

Failure in DFSQMGR to update modname RC not 0.

**0621**

Failure in DFSQMGR to update a message to response mode.

**0622**

Failure in DFSQMGR to cancel a message, RC not 0.

**0623**

Failure in DFSQMGR to delete a message, RC not 0.

**0624**

Failure in DFS62FD0 getting an asynchronous control block (DFS62DST FUNC=FINDD).

**DFSSLUM0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSSLUM0 are given.

**RC****Description****0101**

Failure in DFSQMGR Get Unique or GN call. RC not 0 and QTP1EOM=0.



**0103**

Failure in DFSQMGR Dequeue or Cancel call. RC not 0.

**0107**

Failure to get AWE using DFSBCB macro.

**0108**

QMGR GU call failed with RC08.

**0111**

DFSSLUM0 has been called to deliver a message with zero length to the front-end IMS system. A DFS2224 message will be sent instead.

**0121**

Failure to get LUMP pool buffer using DFSPPOOL macro.

**0122**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**DFS6CKP0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6CKP0 are given.

**RC****Description****2201**

Invalid checkpoint type specified in parameter list. Should be ALL or STATUS.

**2202**

Data block too large for log record.

**DFS6ECT0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6ECT0 are given.

**RC****Description****3101**

Error freeing XAWE using DFSBCB macro.

**3102**

Error freeing XAWE using STORAGE macro.

**3104**

Invalid AWE request.

**3105**

Failure in DFSTM0 to connect all dependent regions FUNC=CONALL.

**3107**

Failure in DFSBCB to get AWE storage

**3109**

Error detected in DFS6IDC0 building user descriptors.

**3110**

Error getting CIOP storage using DFSPPOOL macro.

**3111**

Error freeing CIOP storage using DFSPPOOL macro.

**3112**

VTAM MODIFY USERVAR failed during activation of XRF alternate.

**3113**

VTAM VARY NET TERM failed for termination of primary system.

**3114**

Error Posting asynchronous control block using DFSSERVER macro.

**3115**

Error Checking synchronous control block using DFSSERVER macro.

**3116**

VTAM MODIFY USERVAR failed for activation of primary system.

**DFS6IDC0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6IDC0 are given.

**RC****Description****2401**

Unable to obtain storage for BPAM buffer using STORAGE macro.

**2402**

Unable to release storage for BPAM buffer using STORAGE macro.

**2403**

Unknown DFS warning message number.

**2404**

Failure to get LUMP pool buffer using DFSPPOOL macro.

When this reason code is issued, the error message is followed by a U0732 abend.

**2405**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**DFS6LUS0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6LUS0 are given.

**RC****Description****1004**

No synchronous control block given in SEND service call.

**1007**

TIB was released while the task was waiting to synchronize.

**1008**

TIB\_SYNC\_PTR was changed, but not to zero.

**1010**

Unknown service call in main program.

**1012**

Unable to get storage for LU 6.2 message prefix using DFSBCB macro.

**1013**

Unable to create an asynchronous control block using DFS62DST FUNC=FUNC.

**1015**

No LUM block given in BLDPRE service call.

**1016**

Unable to find asynchronous control block or create a new one in CHNG service call. DFS62DST FUNC(FIND).

**1018**

Conversation-id zero at send time.

**1020**

Return Code X'1C' from Queue Manager Get Unique call.

**1022**

Unable to free storage for LU 6.2 message prefix using DFSBCB macro.

**1027**

Expect input LU 6.2 msg prefix in COPYPF62 service call.

**1029**

Expect input synchronous/asynchronous control block in COPYPF62 service call.

**1031**

Invalid TPN=DFSSIDE in CHNG service call.

**1032**

Unable to find LU 6.2 descriptor entry in BLDPRE service call using DFS62DST macro.

**1060**

Failure in DFSBCB to get AWE.

**1061**

Failure in DFSBCB to free AWE.

**1062**

Failure to get LUMP pool buffer using DFSPPOOL macro.

**1063**

Failure in SENDMSG using DFSXCF macro.

**1064**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**DFS6LUS1**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6LUS1 are given.

**RC****Description****1110**

Unknown service call in main program.

**1117**

No message prefix or synchronous/asynchronous control block given in INQY service call.

**1123**

Unable to clean up TP.

**1124**

Unable to clean up in the address space.

**1125**

No synchronous control block is given in TIBINFO service call

**1126**

Unable to find the asynchronous or restart synchronous control block in GETQABTIB service call.

**1127**

DFS6LUS1 cannot find TIB/QAB.

**1130**

Unable to post RLM back in CONVCONT service call.

**1133**

Unable to find LU 6.2 descriptor entry in INQY service call.

**1134**

No message prefix supplied in GETQABTIB service call.

**1140**

DFSQMGR Get Unique or Insert Move call failed in MSGROUTE service call.

**1142**

Unable to find or to create a synchronous control block in FPGU service call.

**1143**

Unable to free a synchronous control block (DFS62DST FUNC=RELEASE).

**1150**

Return code from ATBRCVW in PH1 service call (abort synchpoint).

**1151**

Return code from ATBGTA2 in PH1 service call (abort synchpoint).

**DFS6LUS2**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6LUS2 are given.

**RC****Description****1201**

No PCB given in READSQ service.

**1202**

No control block given in READSQ service.

**1203**

Invalid control block type in READSQ service.

**1204**

DFSQMGR Get Unique failure in READSQ service.

**1205**

DFSQMGR Enqueue failure in READSQ service.

**1206**

DFSQMGR Dequeue failure in READSQ service.

**1207**

Failure to get LUMP pool buffer using DFSPPOOL macro.

**1208**

Failure to free LUMP pool buffer using DFSPPOOL macro.

**1209**

Failure to get MSEB storage using DFSBCB macro.

**1210**

Failure to free MSEB storage using DFSBCB macro.

**1211**

Failure to get HIOP storage using DFSPPOOL macro.

**1212**

Failure to free HIOP storage using DFSPPOOL macro.

**1224**

CQS not available in READSQ service.

**DFS6QFX0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6QFX0 are given.

**RC****Description**

**3601**

Failure in creating a restart control block.

**3602**

Failure in DFSCIR to create restart ITASK.

**3603**

Failure in IXCTL to run under restart ITASK.

**3604**

Failure in DFSCIR to delete restart ITASK.

**3682**

Issue /STO APPC if APPC/IMS was started; then issue /STA APPC.

**DFS6RST0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS6RST0 are given.

**RC****Description****2101**

Log record type not X'22', X'23', or X'24'.

**2102**

Log record code not X'40'.

**DFS62FD0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS62FD0 are given.

**RC****Description****3201**

Failure in DFSBCB to release LU block.

**3202**

Failure in DFSBCB to release asynchronous control block.

**3203**

Failure in DFSBCB to get asynchronous control block.

**3204**

Failure in DFSBCB to release asynchronous control block. (Second location within module.)

**3205**

Failure in DFSTCBTB FUNC=LOCATE.

**3206**

Failure in DFSCIR to create ITASK.

**3207**

Failure in DFSBCB to get synchronous control block.

**3208**

Failure in DFSCIR to delete ITASK for asynchronous message.

**3209**

Failure in DFSCIR FUNC=DTASK to release duplicate ITASK for asynchronous message.

**3210**

Synchronous control block to be released not found in chain.

**3211**

Input parameter list is invalid, unknown type.

**3213**

DFSCS failed adding synchronous control block to chain.

**3216**

IMODULE DELETE failed while releasing asynchronous control block.

**3217**

Blank LUNAME or nonblank SIDENAME with TPNAME='DFSSIDE'.

**3220**

Invalid parameters on module entry.

**3221**

Invalid parameters on module entry.

**3222**

Failure to free HIOP storage using DFSPPOOL macro.

**3223**

Failure to free HIOP storage using DFSPPOOL macro.

**3224**

Failure to free MSEB storage using DFSBCB macro.

**DFS62FD1**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFS62FD1 are given.

**RC****Description****3801**

Input parameter list is invalid, unknown type.

**3802**

Failure in DFSBCB FUNC=GET to get LU block.

**3803**

Failure in DFSBCB FUNC=REL to release LU block.

**3804**

Failure in DFSBCB FUNC=GET to get descriptor.

**3805**

Failure in DFSCS for inserting descriptor into table.

**3806**

IMODULE DELETE failed for delete of restart synchronous control block hash table.

**3807**

Failure in DFSBCB FUNC=GET to get synchronous control block.

**3808**

Failure in DFSBCB FUNC=REL to release restart asynchronous control block.

**DFSLUM00**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSLUM00 are given.

**RC****Description****5101**

Failure in DFSQMGR Get Unique for notify message.

**5102**

Failure in DFS62FD0 finding an asynchronous control block for notify message.

**5109**

Unknown return code from z/OS clean address space call.

**5110**

Unknown return code from z/OS unidentify call.

**5111**

IXCLEAVE unsuccessful.

**DFSHAV70**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSHAV70 are given.

**RC****Description****3709**

Unknown return code from z/OS clean address space call.

**3710**

Unknown return code from z/OS unidentify call.

**3711**

IXCLEAVE unsuccessful.

**DFSXLUM0**

APPC/IMS issues message DFS1959E when a severe internal error occurs. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message. Reason codes for message DFSXLUM0 are given.

**RC****Description****5009**

Unknown return code from z/OS clean address space call.

**5010**

Unknown return code from z/OS unidentify call.

**5011**

IXCLEAVE unsuccessful.

**DFS1965E APPC/MVS call failures**

The APPC/IMS diagnostic aids include DFS1965E APPC/MVS call failures. If you receive this message, contact IBM® Software Support with the module number and reason code supplied in the message.

A call to APPC/MVS had an unexpected return code. The call for FUNCTION=aaaaaaa was issued, and a return code xx from APPC/MVS was the result. Return code xx denotes the specific IMS module performing the APPC call. Error return codes that represent anticipated conditions are handled by IMS, and do not result in this message. This message is produced when an unexpected result is encountered, which might represent an abnormal condition in some system component.

**RC****Description****xx90**

Synchronous call failure

**xx91**

Asynchronous call failure

## Diagnostics for use with synchronous APPC and OTMA with shared queues

Synchronous APPC and OTMA message processing in the shared queues environment introduces additional diagnostic considerations for the message flow.

In addition to the APPC and OTMA traces already used, other facilities include:

- IMS Resource Recovery Trace
- z/OS Resource Recovery Trace
- z/OS APPC Trace
- Console memory dumps of the z/OS Resource Recovery Services and APPC address and data spaces.

If IMS is using z/OS cross-system coupling facility for communication, a memory dump of the RRS address space is unavailable.

### Related tasks

[“Resource Recovery Services trace” on page 658](#)

The Resource Recovery Services trace (RRST) provides information about relevant z/OS Resource Recovery Services (RRS) events in the IMS dependent region. Use the trace under direction of IBM Software Support when problems are suspected in the RRS area.

## SNAPs and dumps

For errors that do not result in an abend, IMS writes a X'67D0' log record or produces an SDUMP, depending on the error. The minimum data dumped for LU 6.2 problems are the control blocks that are associated with the task in error and the appropriate trace tables.

## OTMA diagnostic aids

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OTMA diagnostic aids include OTMA trace, module-to-code cross references, verb-to-code cross references, DFS1296E message information, log records, and SNAPs and dumps.

### OTMA trace

The OTMA trace records the flow of control through IMS OTMA. Turn on the OTMA trace only if the IBM support representative requests it.

#### Starting the OTMA trace

The **/TRACE SET ON TABLE OTMT** command activates the trace and sends the entries to an internal table.

You can format the table using the Offline Dump Formatter under IPCS, using either the VERBX command or the IMS Dump Formatter panels.

If a SNAP dump is taken, the table is formatted as part of the IMS dump. If you add the OPTION LOG parameter to the **/TRACE** command, IMS sends the output to an external data set. You can use the File Select and Format utility (DFSERA10) with exit routine DFSERA60 to format trace entries.

#### Related concepts

[“Formatting IMS dumps offline” on page 560](#)



Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

### Format of OTMA trace records

Each record of the OTMA trace record format is eight words long, and word 0 holds standard information.

Table 91. OTMA trace record format

| WORD 0 |         | WORD 1 | WORD 2 | WORD 3 | WORD 4 | WORD 5 | WORD 6 | WORD 7 |
|--------|---------|--------|--------|--------|--------|--------|--------|--------|
| ID     | SEQ NUM |        |        |        |        |        |        |        |

where

**represents**

#### ID

2-byte trace ID

#### SEQ NUM

2-byte trace sequence number assigned by the IMS trace component

Words 1 through 7 contain data specific to each trace entry, as described below:

Trace ID = X'5A01' OTMA module entry

#### Word 1

Byte 0: Module number

Bytes 1-3: Reserved

#### Word 2

A(ECB)

#### Word 3

Register 1

#### Words 4-5

Optional user data

#### Words 6-7

Time stamp (STCK)

TRACE ID = X'5A02' OTMA module exit

#### Word 1

Byte 0: Module number

Bytes 1-3: Reserved

#### Word 2

A(ECB)

#### Word 3

Return code

#### Words 4-5

Optional user data

#### Words 6-7

Time stamp (STCK)

TRACE ID = X'5A03' IMS internal OTMA error

#### Word 1

Byte 0: Module number

Bytes 1-3: 0

#### Word 2

A(ECB)

**Word 3**

Error code

**Word 4**

Optional user data

**Word 5**

0

**Words 6-7**

Time stamp (STCK)

TRACE ID = X'5B01' XCF/z/OS entry

**Word 1**

Byte 0: Module number

Byte 1: XCF call number

**Words 2-7**

Control message

TRACE ID = X'5B02' XCF/z/OS exit

**Word 1**

Byte 0: Module number

Byte 1: XCF call number

**Word 2**

A(ECB)

**Word 3-4**

XCF token

**Word 5**

Return code

**Word 6**

Reason code

**Word 7**

Time stamp (short)

TRACE ID = X'5CX' OTMA AWE function

**Word 1**

Byte 0: Module number

**Words 2-6**

Reserved

**Word 7**

Time stamp (short)

TRACE ID = X'5C71' OTMA DFSYPSIO input trace entry

**Word 1**

Byte 0: module number X'25'

Byte 1:

**X'01'**

an input transaction with reroute name specified

**X'02'**

a NAK with reroute request

**X'03'**

a NAK with purge request

Byte 2-3: 0

**Word 2**

Addr(ECB)

**Word 3**

Addr(YQAB) if byte 1 of word 1 is X'01'. Otherwise, it will be Addr(YTQAB).

**Word 4**

0

**Word 5**

Bytes 0-3 of reroute tpipe name

**Word 6**

Bytes 4-7 of reroute tpipe name

**Word 7**

Time stamp (short)

TRACE ID = X'5C72' OTMA DFSYQAB0 output trace entry

**Word 1**

Byte 0: module number X'29'

Byte 1: X'03' reroute on SendOnly output

Byte 2-3: 0

**Word 2**

Addr(ECB)

**Word 3**

Addr(YQAB)

**Word 4**

0

**Word 5**

Bytes 0-3 of reroute tpipe name

**Word 6**

Bytes 4-7 of reroute tpipe name

**Word 7**

Time stamp (short)

TRACE ID = X'5D01' OTMA Find Tpipe or scan Tpipe was invoked

**Word 1**

Return code

**Word 2**

Location code

**Word 3 - 4**

8-byte characters that could be TrcTPIPE, NO TPIPE, or tpipe name.

**Word 5**

0 or member block address

**Word 6-7**

Time stamp (STCK)

TRACE ID = X'5D02' OTMA Find YTIB or scan YTIB was invoked

**Word 1**

Return code or YTIB address

**Word 2**

Location code or TPIPE address

**Word 3 - 4**

8-byte characters that could be NO YTIB or tpipe name

**Word 5**

0 or member block address

**Word 6-7**

Time stamp (STCK)

TRACE ID = X'5D03' Find YQAB or scan YQAB was invoked

**Word 1**

Return code or YQAB address

**Word 2**

Location code or TPIPE address

**Word 3 - 4**

8-byte characters that could be NO YQAB or tpipe name

**Word 5**

0 or member block address

**Word 6-7**

Time stamp (STCK)

**OTMA trace entries for parallel RESUME TPIPE request processing (X'5A20')**

OTMA trace entries for parallel RESUME TPIPE request processing have the trace ID X'5A20' in byte 0 and 1 of word 0.

**ID X'23' - Trace entries for the DFSYMEM0 module**

*Table 92. Trace entry for the activation or deletion of a RESUME TPIPE YQAB (MQAB) for a RESUME TPIPE request*

| Word        | Byte   | Contents                                           |                                                                           |
|-------------|--------|----------------------------------------------------|---------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                    |                                                                           |
|             | Byte 1 | Location ID:                                       |                                                                           |
|             |        | <b>X'20'</b>                                       | DFSYMEM0 activated a RESUME TPIPE YQAB (MQAB) for a RESUME TPIPE request. |
|             |        | <b>X'2D'</b>                                       | DFSYMEM0 deleted a resume tpipe YQAB (MQAB) for a resume tpipe request.   |
|             | Byte 2 | 0                                                  |                                                                           |
|             | Byte 3 | 0                                                  |                                                                           |
| Words 2 - 3 |        | YQAB token (MQAB token) for a RESUME TPIPE request |                                                                           |
| Words 4 - 5 |        | RESUME TPIPE token                                 |                                                                           |
| Words 6 - 7 |        | STCK                                               |                                                                           |

Table 93. Trace entry for queuing a RESUME TPIPE request to a tpipe

| Word        | Byte   | Contents                                                                                        |
|-------------|--------|-------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                 |
|             | Byte 1 | Location ID:<br><b>X'21'</b><br>The DFSYMEM0 module queued a RESUME TPIPE request to the tpipe. |
|             | Byte 2 | 0                                                                                               |
|             | Byte 3 | 0                                                                                               |
| Words 2 - 3 |        | YQAB token for a hold queue                                                                     |
| Words 4 - 5 |        | RESUME TPIPE token                                                                              |
| Words 6 - 7 |        | STCK                                                                                            |

Table 94. Trace entry for processing the exit of a client from the XCF group

| Word        | Byte   | Contents                                                                                                           |
|-------------|--------|--------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                                    |
|             | Byte 1 | Location ID:<br><b>X'22'</b><br>DFSYMEM0 processed the XCF leave for the client that is identified in words 2 - 5. |
|             | Byte 2 | 0                                                                                                                  |
|             | Byte 3 | 0                                                                                                                  |
| Words 2 - 5 |        | The name of the OTMA client member that left the XCF group                                                         |
| Words 6 - 7 |        | STCK                                                                                                               |

Table 95. Trace entry for a super member that processes the exit of a client from the XCF group

| Word        | Byte   | Contents                                                                                                                                             |
|-------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                                                                      |
|             | Byte 1 | Location ID:<br><b>X'23'</b><br>DFSYMEM0, which is a super member, processed the exit from the XCF group of the client that is named in words 4 - 5. |
|             | Byte 2 | 0                                                                                                                                                    |
|             | Byte 3 | 0                                                                                                                                                    |
| Words 2 - 3 |        | The name of the super member.                                                                                                                        |
| Words 4 - 5 |        | The first eight bytes of the client member name.                                                                                                     |
| Words 6 - 7 |        | STCK                                                                                                                                                 |

Table 96. Trace entry for a change in the number of inactive RESUME TPIPE requests that are queued to the tpipe

| Word        | Byte   | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|             | Byte 1 | Location ID:<br><b>X'24'</b><br>The number of inactive RESUME TPIPE requests that are queued to the tpipe before cleanup logic is shown in word 3.<br><b>X'25'</b><br>The number of inactive RESUME TPIPE requests that are queued to the tpipe after cleanup logic is shown in word 3.<br><b>X'28'</b><br>An MQAB was reused for a queued RESUME TPIPE request. The total count of MQABs that are associated with the tpipe hold queue after cleanup logic is shown in word 3. |
|             | Byte 2 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|             | Byte 3 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Word 2      |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Word 3      |        | <b>YQAB_RT_QUEUE_CT</b><br>The number of number of inactive RESUME TPIPE requests that are currently queued to the tpipe.                                                                                                                                                                                                                                                                                                                                                       |
| Words 4 - 5 |        | The hold queue YQAB token.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Words 6 - 7 |        | STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 97. Trace entry for the number of active RESUME TPIPE requests (MQABs) on the tpipe

| Word   | Byte   | Contents                                                                                                                                                                                                                                                                  |
|--------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'23'                                                                                                                                                                                                                                                           |
|        | Byte 1 | Location ID:<br><b>X'26'</b><br>The number of active RESUME TPIPE YQABs (MQABs) for the tpipe before cleanup processing is shown in word 3.<br><b>X'27'</b><br>The number of active RESUME TPIPE YQABs (MQABs) for the tpipe after cleanup processing is shown in word 3. |
|        | Byte 2 | 0                                                                                                                                                                                                                                                                         |
|        | Byte 3 | 0                                                                                                                                                                                                                                                                         |

Table 97. Trace entry for the number of active RESUME TPIPE requests (MQABs) on the tpipe (continued)

| Word        | Byte | Contents                                                                          |
|-------------|------|-----------------------------------------------------------------------------------|
| Word 2      |      | <b>TPIPE_MQAB_CT</b><br>The total number of MQABs, including disabled MQABs.<br>: |
| Word 3      |      | <b>TPIPE_MQAB_DCT</b><br>The total number of disabled MQABs.                      |
| Words 4 - 5 |      | The YQAB token of the tpipe hold queue.                                           |
| Words 6 - 7 |      | STCK                                                                              |

Table 98. Trace entry for the number of MQABs that a tpipe hold queue

| Word        | Byte   | Contents                                                                                                                                                                                                                                                                            |
|-------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                                                                                                                                                                                                     |
|             | Byte 1 | Location ID:<br><b>X'2A'</b><br>A cancel resume TPIPE request was received from a client. The associated MQAB is deleted.<br><b>X'2B'</b><br>A cancel resume TPIPE request was initiated by DFSYQAB0 upon the completion of a resume TPIPE request. The associated MQAB is deleted. |
|             | Byte 2 | 0                                                                                                                                                                                                                                                                                   |
|             | Byte 3 | 0                                                                                                                                                                                                                                                                                   |
| Words 2 - 3 |        | The name of the tpipe.                                                                                                                                                                                                                                                              |
| Words 4 - 5 |        | The RESUME TPIPE token                                                                                                                                                                                                                                                              |
| Words 6 - 7 |        | STCK                                                                                                                                                                                                                                                                                |

Table 99. Trace entry for an attempt to delete the YQAB of an active RESUME TPIPE request

| Word   | Byte   | Contents                                                                                                                                              |
|--------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'23'                                                                                                                                       |
|        | Byte 1 | Location ID:<br><b>X'2C'</b><br>An attempt was made to delete this RESUME TPIPE YQAB, but it could not be deleted because the RESUME TPIPE is active. |
|        | Byte 2 | 0                                                                                                                                                     |
|        | Byte 3 | 0                                                                                                                                                     |
| Word 2 |        | 0                                                                                                                                                     |
| Word 3 |        | <b>TPIPE_MQAB_DCT</b><br>The total number of disabled MQABs.                                                                                          |

Table 99. Trace entry for an attempt to delete the YQAB of an active RESUME TPIPE request (continued)

| Word        | Byte | Contents                |
|-------------|------|-------------------------|
| Words 4 - 5 |      | The RESUME TPIPE token. |
| Words 6 - 7 |      | STCK                    |

Table 100. Trace entry for when the number of active RESUME TPIPE requests reaches the LIMITRTP value

| Word        | Byte   | Contents                                                                                                                                          |
|-------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'23'                                                                                                                                   |
|             | Byte 1 | Location ID:<br><b>X'30'</b><br>The number of active RESUME TPIPE requests reached the LIMITRTP value that is currently in effect for this tpipe. |
|             | Byte 2 | 0                                                                                                                                                 |
|             | Byte 3 | 0                                                                                                                                                 |
| Word 2      |        | 0                                                                                                                                                 |
| Word 3      |        | <b>MCB_MQAB_LIMIT</b><br>The LIMITRTP value in effect for this tpipe.                                                                             |
| Words 4 - 5 |        | The tpipe name.                                                                                                                                   |
| Words 6 - 7 |        | STCK                                                                                                                                              |

#### ID X'29' - Trace entries for the DFSYQAB0 module

Table 101. Trace entry for the activation of a RESUME TPIPE YQAB (MQAB)

| Word        | Byte   | Contents                                                                 |
|-------------|--------|--------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'29'                                                          |
|             | Byte 1 | Location ID:<br><b>X'01'</b><br>A RESUME TPIPE YQAB (MQAB) was activated |
|             | Byte 2 | 0                                                                        |
|             | Byte 3 | 0                                                                        |
| Words 2 - 3 |        | Resume TPIPE YQAB token                                                  |
| Words 4 - 5 |        | The name of the tpipe.                                                   |
| Words 6 - 7 |        | STCK                                                                     |



Table 102. Trace entry for the processing of a synchronous callout request by a RESUME TPIPE YQAB (MQAB)

| Word        | Byte   | Contents                                                                                          |
|-------------|--------|---------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'29'                                                                                   |
|             | Byte 1 | Location ID:<br><b>X'02'</b><br>A RESUME TPIPEYQAB (MQAB) processed a synchronous callout request |
|             | Byte 2 | 0                                                                                                 |
|             | Byte 3 | 0                                                                                                 |
| Words 2 - 3 |        | Resume TPIPE YQAB token                                                                           |
| Words 4 - 5 |        | AWE token for the synchronous callout request                                                     |
| Words 6 - 7 |        | STCK                                                                                              |

Table 103. Trace entry for RESUME TPIPE YQAB(MQAB) processing

| Word        | Byte   | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1      | Byte 0 | Module ID X'29'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|             | Byte 1 | Location ID:<br><b>X'03'</b><br>A synchronous callout request was processed by the RESUME TPIPErequest that is identified by the token in words 4 and 5.<br><b>X'04'</b><br>An asynchronous callout request was processed by the RESUME TPIPErequest that is identified by the token in words 4 and 5.<br><b>X'05'</b><br>A NAK was received for a RESUME TPIPE YQAB (MQAB).<br><b>X'06'</b><br>ACK was received for a RESUME TPIPE YQAB (MQAB).<br><b>X'07'</b><br>A request to delete a RESUME TPIPE YQAB (MQAB). |
|             | Byte 2 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|             | Byte 3 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Words 2 - 3 |        | Resume TPIPE YQAB token                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Words 4 - 5 |        | RESUME TPIPE token                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Words 6 - 7 |        | STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## OTMA trace entry for user exits

Trace IDs and their words are listed for the user exits.

### OTMA trace entry for TRACE ID = X'5A05' (OTMAIOED user exit entry)

Table 104. Contents of words 1 - 7 for X'5A05' trace entries in OTMAIOED user exit entry

| Word     |          | Contents            |
|----------|----------|---------------------|
| Word 1   | Byte 0   | Module number X'33' |
|          | Byte 1-3 | 0                   |
| Word 2   |          | A(ECB)              |
| Word 3   |          | 0                   |
| Word 4   |          | 0                   |
| Word 5   |          | 0                   |
| Word 6-7 |          | Time stamp (STCK)   |

### OTMA trace entry for TRACE ID = X'5A06' (OTMAIOED user exit entry)

Table 105. Contents of words 1 - 7 for X'5A06' trace entries in OTMAIOED user exit entry

| Word     |          | Contents                  |
|----------|----------|---------------------------|
| Word 1   | Byte 0   | Module number X'33'       |
|          | Byte 1-3 | 0                         |
| Word 2   |          | A(ECB)                    |
| Word 3   |          | Exit RC set by the module |
| Word 4   |          | 0                         |
| Word 5   |          | 0                         |
| Word 6-7 |          | Time stamp (STCK)         |

### OTMA trace entry for TRACE ID = X'5A07' (OTMAYPRX user exit entry)

Table 106. Contents of words 1 - 7 for X'5A07' trace entries in OTMAYPRX user exit entry

| Word     |          | Contents            |
|----------|----------|---------------------|
| Word 1   | Byte 0   | Module number X'31' |
|          | Byte 1-3 | 0                   |
| Word 2   |          | A(ECB)              |
| Word 3   |          | 0                   |
| Word 4   |          | 0                   |
| Word 5   |          | 0                   |
| Word 6-7 |          | Time stamp (STCK)   |

**OTMA trace entry for TRACE ID = X'5A08' (OTMAYPRX user exit entry)***Table 107. Contents of words 1 - 7 for X'5A08' trace entries in OTMAYPRX user exit entry*

| <b>Word</b> |          | <b>Contents</b>              |
|-------------|----------|------------------------------|
| Word 1      | Byte 0   | Module number X'31'          |
|             | Byte 1-3 | 0                            |
| Word 2      |          | A(ECB)                       |
| Word 3      |          | Exit RC set by the module    |
| Word 4      |          | 0                            |
| Word 5      |          | IMS internal processing code |
| Word 6-7    |          | Time stamp (STCK)            |

**OTMA trace entry for TRACE ID = X'5A09' (user exit DFSYDRU0 module entry)***Table 108. Contents of words 1 - 7 for X'5A09' trace entries in user exit DFSYDRU0 module entry*

| <b>Word</b> |          | <b>Contents</b>     |
|-------------|----------|---------------------|
| Word 1      | Byte 0   | Module number X'32' |
|             | Byte 1-3 | 0                   |
| Word 2      |          | A(ECB)              |
| Word 3      |          | 0                   |
| Word 4      |          | 0                   |
| Word 5      |          | 0                   |
| Word 6-7    |          | Time stamp (STCK)   |

**OTMA trace entry for TRACE ID = X'5A0A' (user exit DFSYDRU0 module exit)***Table 109. Contents of words 1 - 7 for X'5A0A' trace entries in user exit DFSYDRU0 module exit*

| <b>Word</b> |          | <b>Contents</b>              |
|-------------|----------|------------------------------|
| Word 1      | Byte 0   | Module number X'32'          |
|             | Byte 1-3 | 0                            |
| Word 2      |          | A(ECB)                       |
| Word 3      |          | Exit RC set by the module    |
| Word 4      |          | 0                            |
| Word 5      |          | IMS internal processing code |
| Word 6-7    |          | Time stamp (STCK)            |

**OTMA trace entry for TRACE ID = X'5A0D' (OTMA ALTPCB in DFSYFNDO)***Table 110. Contents of words 1 - 7 for X'5A0D' trace entries in OTMA ALTPCB in DFSYFNDO*

| <b>Word</b> |        | <b>Contents</b>                                     |
|-------------|--------|-----------------------------------------------------|
| Word 1      | Byte 0 | Module number X'1F'                                 |
|             | Byte 1 | <b>X'01'</b><br>Input transaction from legacy       |
|             |        | <b>X'02'</b><br>Input transaction from OTMA         |
|             |        | <b>X'03'</b><br>Match descriptor entry found        |
|             |        | <b>X'04'</b><br>Use descriptor, ignore any exits    |
|             |        | <b>X'05'</b><br>No matching descriptor found        |
|             |        | <b>X'06'</b><br>Descriptor with EXIT=YES found      |
|             |        | <b>X'07'</b><br>No DFSYPRX0 exist                   |
|             |        | <b>X'08'</b><br>Take OTMA finddest processing       |
|             |        | <b>X'09'</b><br>Take legacy finddest processing     |
|             |        | <b>X'10'</b><br>Error finddest processing           |
|             |        | <b>X'11'</b><br>No DRU0 exit found                  |
|             |        | <b>X'12'</b><br>DRU0 exit found                     |
|             |        | <b>X'13'</b><br>DRU0 exit sets legacy destination   |
|             |        | <b>X'14'</b><br>DRU0 exit sets OTMA destination     |
|             |        | <b>X'15'</b><br>DRU0 exit sets RC=101               |
|             |        | <b>X'16'</b><br>DRU0 sets RC=8                      |
|             |        | <b>X'17'</b><br>DRU0 sets RC=100                    |
|             |        | <b>X'18'</b><br>DRU0 error processing               |
|             |        | <b>X'19'</b><br>Destination TPIPE set by descriptor |
|             |        | <b>X'20'</b><br>Destination TPIPE set by DRU exit   |
|             |        | <b>X'21'</b><br>User data exists in OTMA input      |

Table 110. Contents of words 1 - 7 for X'5A0D' trace entries in OTMA ALTPCB in DFSYFND0 (continued)

| Word            |          | Contents                                                                                                                                                                                                                                                                                              |
|-----------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 (cont'd) | Byte 1   | <b>X'22'</b><br>No user data input to DRU0 exit<br><b>X'23'</b><br>DRU0 sets user data for RC=0 or RC=101<br><b>X'24'</b><br>DRU0 does not set user data for RC=0 or RC=101<br><b>X'25'</b><br>Prepare ICON user data based on descriptor<br><b>X'26'</b><br>Prepare MQ user data based on descriptor |
|                 | Byte 2-3 | 0                                                                                                                                                                                                                                                                                                     |
| Word 2-3        |          | 0                                                                                                                                                                                                                                                                                                     |
| Word 4-5        |          | Original CHNG call value                                                                                                                                                                                                                                                                              |
| Word 6-7        |          | Time stamp (STCK)                                                                                                                                                                                                                                                                                     |

### OTMA trace entry for synchronous callout

OTMA trace entries for synchronous callout have the trace ID X'5A04'.

#### Trace entries in module DFSYSCPO

Byte 0 of word 1 is the module identifier X'10'. Byte 1 of word 1 is a location ID that identifies the trace event.

Table 111. Contents of words 1 - 7 for trace entries in module DFSYSCPO

| Word   | Byte   | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID: X'10'                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|        | Byte 1 | Location ID:<br><b>X'11'</b><br>Ready to chain the ICAL AWE to DFSYQAB0<br><b>X'12'</b><br>Failed to activate DFSYQAB0<br><b>X'13'</b><br>Post back by DFSYSCS0 for ICAL<br><b>X'14'</b><br>Post back by DFSYSCS0 for ICAL<br><b>X'15'</b><br>ICAL was rejected by an IMS command<br><b>X'16'</b><br>Processing a response<br><b>X'17'</b><br>Processing a timeout<br><b>X'18'</b><br>Processing an invalid post from DFSYSCS0<br><b>X'19'</b><br>OTMA ACK timeout occurred |
|        | Byte 2 | PSTFLAG2                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|        | Byte 3 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Word 2 |        | PST address of the ICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Word 3 |        | YQAB address                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Word 4 |        | AWORNAME (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID                                                                                                                                                                                                                                                                                                                                                                                                        |
| Word 5 |        | AWORNAME (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID                                                                                                                                                                                                                                                                                                                                                                                                        |
| Word 6 |        | First half of STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Word 7 |        | Second half of STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

#### Trace entries in module DFSYQAB0

Byte 0 of word 1 is the module identifier X'29'. Byte 1 of word 1 is a location ID that identifies the trace event.

Table 112. Contents of words 1 - 7 for trace entries in module DFSYQAB0

| Word   |              | Contents                                                             |                                      |
|--------|--------------|----------------------------------------------------------------------|--------------------------------------|
| Word 1 | Byte 0       | Module ID: X'29'                                                     |                                      |
|        | Byte 1       | Location ID:                                                         |                                      |
|        |              | <b>X'11'</b>                                                         | Pre-call to the Edit_N_Send for ICAL |
|        |              | <b>X'12'</b>                                                         | Waking up to process an ACK or NAK   |
|        |              | <b>X'13'</b>                                                         | Late ACK received after response     |
|        | <b>X'14'</b> | Getting an ACK for ICAL                                              |                                      |
|        | <b>X'15'</b> | Getting a NAK for ICAL                                               |                                      |
|        | Byte 2       | PSTFLAG2                                                             |                                      |
|        | Byte 3       | 0                                                                    |                                      |
| Word 2 |              | State of this ICAL: AWOSTATE                                         |                                      |
| Word 3 |              | YQAB address                                                         |                                      |
| Word 4 |              | AWORNAME (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID |                                      |
| Word 5 |              | AWORNAME (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID |                                      |
| Word 6 |              | First half of STCK                                                   |                                      |
| Word 7 |              | Second half of STCK                                                  |                                      |

#### Trace entries in module DFSYMEM0

Trace entries in this module have the module ID X'23' and are organized in one of two formats. If the location identifier is X'10', words 2 - 5 are 0 as shown in the following table.

Table 113. Contents of words 1 - 7 for trace entries in module DFSYMEM0 for location ID X'10'

| Word   |        | Contents           |  |
|--------|--------|--------------------|--|
| Word 1 | Byte 0 | Module ID: X'23'   |  |
|        | Byte 1 | Location ID: X'10' |  |
|        |        | <b>X'10'</b>       |  |
|        |        |                    |  |
|        | Byte 2 | PSTFLAG2           |  |
|        | Byte 3 | 0                  |  |
| Word 2 |        | 0                  |  |
| Word 3 |        | 0                  |  |
| Word 4 |        | 0                  |  |
| Word 5 |        | 0                  |  |

Table 113. Contents of words 1 - 7 for trace entries in module DFSYMEM0 for location ID X'10' (continued)

| Word   | Contents            |
|--------|---------------------|
| Word 6 | First half of STCK  |
| Word 7 | Second half of STCK |

The following table shows the trace entry format for all other location identifiers in module DFSYMEM0.

Table 114. Contents of words 1 - 7 for trace entries in module DFSYMEM0 for location IDs other than X'10'

| Word   | Contents                                                             |                                                                                                                                                                                                                                                                         |
|--------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0                                                               | Module ID: X'23'                                                                                                                                                                                                                                                        |
|        | Byte 1                                                               | Location ID:<br><b>X'11'</b><br>Getting a response message from the client<br><b>X'12'</b><br>An invalid AWE state was detected for ICAL<br><b>X'13'</b><br>An internal post error was reported by DFSYSCS0<br><b>X'14'</b><br>The AWE of the ICAL has an unknown state |
|        | Byte 2                                                               | PSTFLAG2                                                                                                                                                                                                                                                                |
|        | Byte 3                                                               | 0                                                                                                                                                                                                                                                                       |
| Word 2 | State of this ICAL: AWOSTATE                                         |                                                                                                                                                                                                                                                                         |
| Word 3 | YQAB address                                                         |                                                                                                                                                                                                                                                                         |
| Word 4 | AWORNAME (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID |                                                                                                                                                                                                                                                                         |
| Word 5 | AWORNAME (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID |                                                                                                                                                                                                                                                                         |
| Word 6 | First half of STCK                                                   |                                                                                                                                                                                                                                                                         |
| Word 7 | Second half of STCK                                                  |                                                                                                                                                                                                                                                                         |

#### Trace entries in module DFSYMEM0

Byte 0 of word 1 is the module identifier X'22'. Byte 1 of word 1 is a location ID that identifies the trace event.



Table 115. Contents of words 1 - 7 for trace entries in module DFSYMOM0

| Word   |        | Contents                                                             |
|--------|--------|----------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID: X'22'                                                     |
|        | Byte 1 | Location ID:<br><b>X'11'</b><br>The ICAL has timed out               |
|        | Byte 2 | PSTFLAG2                                                             |
|        | Byte 3 | 0                                                                    |
| Word 2 |        | State of this ICAL: AWOSTATE                                         |
| Word 3 |        | YQAB address                                                         |
| Word 4 |        | AWORNAME (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID |
| Word 5 |        | AWORNAME (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID |
| Word 6 |        | First half of STCK                                                   |
| Word 7 |        | Second half of STCK                                                  |

**Related concepts**

[Synchronous callout requests \(Communications and Connections\)](#)

## OTMA trace entry for synchronous program switch

OTMA trace entries for synchronous program switch have the trace ID X'5A0B'.

Table 116. Contents of trace entry X'5A0B' for module DFSYSCP0

| Word   | Byte   | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'10'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>Post DFSYTIB0 to process the synchronous program switch. Word 3 contains the YTIB CLB address.<br><b>X'30'</b><br>Received a NACK from DFSYTIB0. Word 2 contains the return code to DFSDLA40. Word 3 contains the extended return code.<br><b>X'31'</b><br>Response returned. Word 2 contains the return code to DFSDLA40. Word 3 contains the extended return code.<br><b>X'32'</b><br>Target application abend. Word 2 contains the return code to DFSDLA40. Word 3 contains the extended return code.<br><b>X'33'</b><br>A CM0 application abend was detected. Word 3 contains the extended return code.<br><b>X'34'</b><br>A CM0 response was detected. Word 3 contains the extended return code. This location is used when REPLYCHK=NO and there are multiple responses to the ICAL request.<br><b>X'35'</b><br>The ICAL was canceled by an IMS command. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code. |

Table 116. Contents of trace entry X'5A0B' for module DFSYSCP0 (continued)

| Word               | Byte               | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 (continued) | Byte 1 (continued) | <p><b>X'36'</b><br/>Timeout occurred. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code.</p> <p><b>X'41'</b><br/>Bad transaction code, CPIC transaction, or conversational transaction. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code.</p> <p><b>X'42'</b><br/>Security failed in APPC RACINIT. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code.</p> <p><b>X'43'</b><br/>Security failed in OTMA RACINIT. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code.</p> <p><b>X'44'</b><br/>Security failed in DFSDAUT0. Word 2 has the return code to DFSDLA40. Word 3 has the extended return code.</p> |
|                    | Byte 2             | PSTFLAG2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                    | Byte 3             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Word 2             |                    | PST address of the ICAL that initiated the synchronous program switch, or the return code to DFSDLA40.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Word 3             |                    | Extended return code, or the YTIB CLB address of the ICAL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Word 4             |                    | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Word 5             |                    | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Word 6             |                    | First half of STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Word 7             |                    | Second half of STCK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 117. Contents of trace entry X'5A0B' for module DFSYTIB0

| Word   | Byte   | Contents                                                                |
|--------|--------|-------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'28'                                                         |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>SPS shared queues AOS=X enqueue.        |
|        | Byte 2 | YTIB_SPS_STATUS                                                         |
|        | Byte 3 | 0                                                                       |
| Word 2 |        | YTIB_SPS_Flags                                                          |
| Word 3 |        | YTIB CLB address of the ICAL                                            |
| Word 4 |        | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID. |
| Word 5 |        | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID. |
| Word 6 |        | First half of STCK                                                      |
| Word 7 |        | Second half of STCK                                                     |

Table 118. Contents of trace entry X'5A0B' for module DFSYSLM0

| Word   | Byte   | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'2D'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>CM1 LUMIF SEND was invoked to process a potential CM1 response. This response could be a late response, a DFS2082 message, a regular response, or a timed-out message. Word 3 contains the front-end YTIB CLB address.<br><b>X'22'</b><br>CM1 response reroute is needed. Word 2 contains the YTIB_SPS_Flags.<br><b>X'23'</b><br>SPS shared queues back-end message processing. Word 2 contains the YTIB_SPS_Flags.<br><b>X'24'</b><br>SPS shared queues front-end message processing. Word 2 contains the YTIB_SPS_Flags. |
|        | Byte 2 | YTIB_SPS_STATUS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|        | Byte 3 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Word 2 |        | LUP_FE_TIB_PTR or YTIB_SPS_Flags                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Table 118. Contents of trace entry X'5A0B' for module DFSYSLM0 (continued)

| Word   | Byte | Contents                                                                |
|--------|------|-------------------------------------------------------------------------|
| Word 3 |      | YTIB CLB address of the ICAL                                            |
| Word 4 |      | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID. |
| Word 5 |      | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID. |
| Word 6 |      | First half of STCK                                                      |
| Word 7 |      | Second half of STCK                                                     |

Table 119. Contents of trace entry X'5A0B' for module DFSYLUS0

| Word   | Byte   | Contents                                                                                                         |
|--------|--------|------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'2A'                                                                                                  |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>DFSYLUS0 is ready to post back to DFSYMEM0 for an ICAL response.                 |
|        |        | <b>X'22'</b><br>No ICAL response will be sent because of a timed-out or late message, or a <b>PSTOP</b> command. |
|        |        | <b>X'23'</b><br>No ICAL response will be sent because REPLYCHK=NO and DFS2082 message support is enabled.        |
|        |        | <b>X'24'</b><br>Freed the YTIB control block in DFSLUS0.                                                         |
|        |        | <b>X'25'</b><br>SPS shared queues back-end GU.                                                                   |
|        | Byte 2 | YTIB_SPS_STATUS                                                                                                  |
|        | Byte 3 | 0                                                                                                                |
| Word 2 |        | YTIB_SPS_Flags                                                                                                   |
| Word 3 |        | YTIB CLB address of the ICAL                                                                                     |
| Word 4 |        | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID.                                          |
| Word 5 |        | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID.                                          |
| Word 6 |        | First half of STCK                                                                                               |
| Word 7 |        | Second half of STCK                                                                                              |

Table 120. Contents of trace entry X'5A0B' for module DFSYQAB0 with location ID X'21' or X'22'

| Word   | Byte   | Contents                                                                                                                               |
|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'29'                                                                                                                        |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>A late message was detected and dequeued.<br><b>X'22'</b><br>A late message was detected and rerouted. |
|        | Byte 2 | LUP_MSG_FLAG4                                                                                                                          |
|        | Byte 3 | 0                                                                                                                                      |
| Word 2 |        | LUP_SPS_EXPTM                                                                                                                          |
| Word 3 |        | LUP_FE_TIB_PTR (the original YTIB CLB for the ICAL)                                                                                    |
| Word 4 |        | LUP_MSG_ARRIVAL_TIME (1:4)<br><b>Note:</b> This identifier is the saved YTIB_TOKEN value                                               |
| Word 5 |        | LUP_MSG_ARRIVAL_TIME (5:8)<br><b>Note:</b> This identifier is the saved YTIB_TOKEN value                                               |
| Word 6 |        | First half of STCK                                                                                                                     |
| Word 7 |        | Second half of STCK                                                                                                                    |

Table 121. Contents of trace entry X'5A0B' for module DFSYQAB0 with location ID X'23'

| Word   | Byte   | Contents                                                                  |
|--------|--------|---------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'29'                                                           |
|        | Byte 1 | Location ID:<br><b>X'23'</b><br>A late message was detected and dequeued. |
|        | Byte 2 | YTIB_SPS_STATUS                                                           |
|        | Byte 3 | 0                                                                         |
| Word 2 |        | YTIB_EVENT                                                                |
| Word 3 |        | The original YTIB CLB for the ICAL                                        |
| Word 4 |        | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID.   |
| Word 5 |        | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID.   |
| Word 6 |        | First half of STCK                                                        |
| Word 7 |        | Second half of STCK                                                       |

Table 122. Contents of trace entry X'5A0B' for module DFSYQAB0 with location ID X'21' or X'22'

| Word   | Byte   | Contents                                                                                                                                                                                                                                 |
|--------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Word 1 | Byte 0 | Module ID X'23'                                                                                                                                                                                                                          |
|        | Byte 1 | Location ID:<br><b>X'21'</b><br>The original YTIB was found. A response to the ICAL call will be sent if the state is OK.<br><b>X'22'</b><br>The ICAL region ended abnormally and IMS is processing a cleanup request for the ICAL call. |
|        | Byte 2 | YTIB_SPS_STATUS                                                                                                                                                                                                                          |
|        | Byte 3 | 0                                                                                                                                                                                                                                        |
| Word 2 |        | YTIB_EVENT                                                                                                                                                                                                                               |
| Word 3 |        | The original YTIB CLB for the ICAL                                                                                                                                                                                                       |
| Word 4 |        | YTIB token (1:4)<br><b>Note:</b> This identifier is the unique ICAL ID.                                                                                                                                                                  |
| Word 5 |        | YTIB token (5:8)<br><b>Note:</b> This identifier is the unique ICAL ID.                                                                                                                                                                  |
| Word 6 |        | First half of STCK                                                                                                                                                                                                                       |
| Word 7 |        | Second half of STCK                                                                                                                                                                                                                      |

### OTMA module-to-code cross-reference table

The OTMA module-to-code cross-reference table consists of module numbers, module name, and a description. You can use this information to associate code xx in message DFS1269E and the module number in trace records X'5A'xx, X'5B'xx and X'5C'xx with a module.

Table 123. OTMA module-to-code cross-reference table

| Module number (decimal) | Module number (hexadecimal) | Module/User exit type | Description                                           |
|-------------------------|-----------------------------|-----------------------|-------------------------------------------------------|
| 19                      | 13                          | DFSYLUS0              | OTMA fast services                                    |
| 20                      | 14                          | DFSYST00              | OTMA storage manager                                  |
| 21                      | 15                          | DFSYRR00              | OTMA destination reroute setup routine                |
| 22                      | 16                          | DFSYIO00              | OTMA input/output setup routine                       |
| 23                      | 17                          | DFSYCM20              | OTMA command processor                                |
| 24                      | 18                          | DFS6DC0               | Read and build LU 6.2 descriptors                     |
| 25                      | 19                          | DFSYCLH0              | OTMA /TRA services                                    |
| 26                      | 1A                          | DFSYRAC0              | OTMA security                                         |
| 27                      | 1B                          | DFSYMGX0              | OTMA z/OS cross-system coupling facility message exit |
| 28                      | 1C                          | DFSYGRX0              | OTMA XCF group exit                                   |

Table 123. OTMA module-to-code cross-reference table (continued)

| Module number (decimal) | Module number (hexadecimal) | Module/User exit type | Description                            |
|-------------------------|-----------------------------|-----------------------|----------------------------------------|
| 29                      | 1D                          | DFSYXMO0              | OTMA attach member OIM TCB             |
| 30                      | 1E                          | DFSYC480              | OTMA STA/STO (join/leave) interface    |
| 31                      | 1F                          | DFSYFND0              | OTMA FINDDEST processor                |
| 32                      | 20                          | DFSYFD00              | OTMA control block processor           |
| 33                      | 21                          | DFSYFD10              | OTMA control block processor           |
| 34                      | 22                          | DFSYMOM0              | OTMA AWE server DFSYMOM0               |
| 35                      | 23                          | DFSYMEM0              | OTMA member AWE server DFSYMEM0        |
| 36                      | 24                          | DFSYIMIO              | OTMA getting storage for new member    |
| 37                      | 25                          | DFSYPSIO              | TPIPE input AWE server DFSYPSIO        |
| 38                      | 26                          | DFSYPSOO              | TPIPE output AWE server DFSYPSOO       |
| 39                      | 27                          | DFSYSND0              | OTMA XCF interface                     |
| 40                      | 28                          | DFSYTIB0              | OTMA synchronous processor DFSYTIB0    |
| 41                      | 29                          | DFSYQAB0              | OTMA asynchronous processor DFSYQAB0   |
| 42                      | 2A                          | DFSYLUS0              | OTMA service module number 0           |
| 43                      | 2B                          | DFSYCMD0              | OTMA command service                   |
| 44                      | 2C                          | DFSYCKP0              | OTMA check point                       |
| 45                      | 2D                          | DFSYSLM0              | OTMA synchronous send module           |
| 46                      | 2E                          | DFSYRST0              | OTMA restart                           |
| 47                      | 2F                          | DFSYIDC0              | OTMA descriptor builder                |
| 48                      | 30                          | DFSYQFXO              | OTMA queue fixer                       |
| 49                      | 31                          | OTMAYPRX              | OTMA Destination Resolution user exit  |
| 50                      | 32                          | DFSYDRU0              | OTMA default DRU exit routine DFSYDRU0 |
| 51                      | 33                          | OTMAIOED              | OTMA Input/Output Edit user exit       |

### OTMA verb-to-code cross-reference table

The OTMA verb-to-code cross-reference table consists of verb numbers, verb name, and a description. You can use this information to associate the z/OS cross-system coupling facility call number in trace record X'5B' xx with a z/OS XCF verb.

Table 124. z/OS XCF verb-to-code cross-reference table

| Verb number (hexadecimal) | Verb name | Verb description                            |
|---------------------------|-----------|---------------------------------------------|
| 01                        | IXCCREAT  | Defines a member to XCF                     |
| 02                        | IXCJOIN   | Enables a member to join a group            |
| 03                        | IXCQUERY  | Return information about groups and members |
| 04                        | IXCMMSGO  | Sends a message to another active member    |



Table 124. z/OS XCF verb-to-code cross-reference table (continued)

| Verb number<br>(hexadecimal) | Verb name | Verb description                       |
|------------------------------|-----------|----------------------------------------|
| 05                           | IXCMSGI   | Receives a message on an active member |
| 06                           | IXCLEAVE  | Disassociates a member from XCF        |

### DFS1269E message information

OTMA issues message DFS1269E when a severe internal error occurs. If you receive this message, contact the IBM Support Center with the module number and reason code supplied in the message, and, if requested, output from the OTMA trace.

The message format is:

```
DFS1269E SEVERE IMS INTERNAL FAILURE, REASON CODE=xxyy
```

Variable *xx* is a decimal number that identifies the module. To determine the module associated with the code, see [Table 123 on page 377](#). Variable *yy* is an internal reason code.

The following two reason codes are module independent. Variable *xx* represents the specific IMS module issuing the macro call.

#### Reason code Description

##### *xx98*

Failure in DFSPPOOL to acquire storage for a variable with the DFSYMAGT macro.

##### *xx99*

Failure in DFSPPOOL to release storage for a variable with the DFSYMARL macro.

Other reason codes are module dependent.

### OTMA log records

To activate OTMA logging, use one of the **/TRA SET ON** commands.

To activate OTMA logging, enter one of the following trace commands from the master terminal or the z/OS console.

```
/TRA SET ON tmember client1.  
/TRA SET ON tmember client1 tpipe tpipe1.
```

### SNAPs and dumps

For errors that do not result in an abend, IMS writes log record X'67D0', or produces an SDUMP, depending on the error. The minimum data dumped for OTMA problems are the control blocks that are associated with the task in error and the appropriate trace tables.

## Diagnosing Fast Path problems related to print data set options: IMS Spool API support

IMS provides an expansion of the DL/I application program interface that allows applications to interface directly to JES and create print data sets on the JES spool. These print data sets can then be made available to print managers and spool servers to serve the needs of the application.

### Understanding parsing errors

The IMS Spool API support provides feedback to the application program when IMS detects errors in the print data set options included on either the CHNG calls or SETO calls. This section describes the high-

level processing of the parameters associated with the CHNG and SETO calls, including some examples of errors and the types of feedback information that can be expected.

Error codes provides a summary of the error codes that can be expected to be returned if the application provides a feedback area. It might be useful for the application to develop ways to display these errors by sending a message to an IMS printer or some other technique that allows examination of the parameter lists and feedback area without having to look at a dump. This section discusses each error code and provides some examples of when the error code might be expected. This discussion applies to these calls when used with the IMS Spool API support.

When diagnosing multiple parsing error return codes, the first code returned should be the most meaningful. Errors detected with incorrect length fields or previously invalid keywords can result in valid keywords being reported as errors.

### Keywords

The parameter lists used with CHNG and SETO calls contain two types of keywords. The two types are those keywords valid for the calls (that is, IAFP, PRTO, TXTU, and OUTN), and the keywords provided as operands of the PRTO keyword (for example, CLASS, FORMS).

This separation of keywords is used to determine what type of keyword validation IMS should perform. When looking for valid keywords on the calls, one set of keywords is valid, and when looking at keywords following the PRTO keyword, another set of keywords are valid. For this reason, incorrectly specified length fields may cause one scan to terminate prematurely and keywords to be invalid because they are incorrectly positioned in the call list.

### Status codes

We can deduct what might be the source of the error code by looking at the status code returned for the call. As a general rule, a status code of AR is given when the keyword is associated with the call and a status code of AS is given when the keyword is invalid as a PRTO option. There might be exceptions to this rule, but in general this will hold true.

### Error code examples

These examples describe errors and the resulting error codes.

Some length fields are omitted from the examples when they are unnecessary to the example. Feedback and options lists that are shown on multiple lines are contiguous, as they are in the working storage of an application.

Subsections:

- [“Error code \(0002\)” on page 380](#)
- [“Error code \(0004\)” on page 381](#)
- [“Error code \(0006\)” on page 381](#)
- [“Error code \(0008\)” on page 382](#)
- [“Error code \(000A\)” on page 382](#)
- [“Error code \(000C\)” on page 382](#)
- [“Error code \(000E\)” on page 382](#)

### Error code (0002)

This code indicates that an invalid keyword was discovered within the call options. The error code of (0002) indicates that the keyword scan being performed is associated with keywords that are valid for the call. For example:

```
CALL = SETO
      01
OPTIONS LIST = PRTO=04DEST(018),CLASS(A),TXTU=SET1
FEEDBACK = TXTU(0002)
```

```
STATUS CODE = AR
```

In this example, the options list contains both the keywords PRTO and TXTU. The TXTU keyword is not valid for the SETO call.

Another example of an error code of (0002) in the feedback is created when the length field that represents the PRTO options is specified as shorter than the actual length of the options. For example:

```
CALL = CHNG
OPTIONS LIST = IAFP=N0M,PRTO=0FDEST(018),LINECT(200),CLASS(A),
              COPIES(80),FORMS(ANS)
FEEDBACK = COPIES(0002),FORMS(0002)
STATUS CODE = AR
```

In this example, the length field of the PRTO options (001F) is too short to contain all the options. As a result, IMS finds the keywords COPIES and FORMS outside the PRTO options list area and indicates that these keywords are not allowed as keywords on the CHNG call.

### Error code (0004)

This error code indicates that an option variable that follows a keyword in the options list for the CALL is not within the length limits for the option. An example of this type of error is the OUTN keyword. The name of the OUTPUT JCL statement must be from 1- to 8-characters. For example:

```
CALL = CHNG
OPTIONS LIST = IAFP=N0M,OUTN=OUTPUTDD1
FEEDBACK = OUTN(0004)
STATUS CODE = AR
```

The operand for the OUTN keyword is 9 bytes and exceeds the maximum value.

### Error code (0006)

This error occurs when IMS is scanning for valid keywords that are associated with the call and encounters the PRTO keyword. On interrogation of the length field associated with the PRTO keyword, IMS discovers that the total length of the options list for the call is too short to contain all of the operands within the PRTO keyword. For example:

```
CALL = CHNG
OPTIONS LIST = 0400 IAFP=N0M,PRTO=0ADEST(018),LINECT(200),CLASS(A),
              05 COPIES(3),FORMS(ANS)
FEEDBACK = PRTO(0006),LINECT(0002),CLASS(0002),COPIES(0002),
              FORMS(0002)
STATUS CODE = AR
```

This example provides an options list that is hexadecimal, 48 (decimal 72) bytes long and the correct length for the options list. The length field of the PRTO keyword incorrectly indicates a length of hexadecimal 5A. The length of the PRTO options exceeds the length of the entire options list so the PRTO keyword is ignored and the rest of the options list scanned for valid keywords. The feedback area contains the PRTO(0006) as we would expect to indicate a length error for this keyword, but we also find that the PRTO keywords are reported to be in error (0002). This is because the keywords beyond the first PRTO keyword, up to the length specified in the options list length field have been scanned in search of valid keywords for the call. The status code of AR tells us that the keywords are considered invalid for the call and not the PRTO keyword.

### Error code (0008)

This error is returned when IMS finds that one of the options for the IAFP keyword has not been specified correctly. For example:

```
CALL = CHNG
      00
OPTIONS LIST = IAFP=N0Z,PRTO=0BDEST(018)
FEEDBACK = IAFP(0008) INVALID VARIABLE
STATUS CODE = AR
```

The message option of the IAFP keyword has been incorrectly specified as 'Z'. This results in the error code (0008).

### Error code (000A)

This error indicates that not all of the necessary keywords have been specified for this call. For example:

```
CALL = CHNG
OPTIONS LIST = TXTU=SET1
FEEDBACK = TXTU(000A)
STATUS CODE = AR
```

For this call, a valid keyword of TXTU was specified but the call also requires that the IAFP keyword be specified if the TXTU keyword is used. Since the IAFP keyword is missing, the error code of (000A) is returned when the TXTU keyword is found.

### Error code (000C)

The error code is reporting a condition in which a set of mutually exclusive keywords are used in the same call options list. A clue to the problem being with the call options and not the PRTO options is given by issuing of the status code of AR and not the status code of AS. For example:

```
CALL = CHNG
      00
OPTIONS LIST = IAFP=A00,PRTO=0BCOPIES(3),TXTU=SET1
FEEDBACK = TXTU(000C)
STATUS CODE = AR
```

In this case, the call options list contains both the keywords of PRTO and TXTU. These options are mutually exclusive and cannot be used in the same options call list. The result is error code of (000C) returned along with status code of AR.

### Error code (000E)

This error code indicates that while parsing the actual print data set descriptors, an error was detected with one or more of the operands. For the most part, IMS does not do any checking for these print descriptors. Instead IMS uses z/OS services (SJF) to do the validation of the print descriptors. When SJF is called, the validation requested is the same as for the TSO OUTDES command. For this reason, IMS is insensitive to changes in output descriptors and the valid descriptors for your system are a function of the z/OS release level.

You can obtain a list of the valid descriptors and the proper syntax by using the TSO HELP OUTDES command.

IMS must first establish that the format of the PRTO options is in a format such that SJF services can be requested. If not, IMS returns status code AS and error code of (000E) and a descriptive error message. If the error has been detected during the SJF process, the error message from SJF includes information of the form, (R.C.=xxxx,REAS.=yyyyyyyy) and an error message indicating the error. The return codes and reason are further identified in the *z/OS MVS Programming: Authorized Assembler Services Reference Vol 1*.

The range of some variables are controlled by the JES initialization parameters. Values for the maximum number of copies, allowable remote destination, classes, and form names are examples of variables influenced by the JES initialization parameters.

The following examples show parsing errors and the resulting error messages:

```
CALL = CHNG
      01
OPTIONS LIST = IAFP=A00,PRTO=0BCOPIES((3),(8,RG,18,80))
FEEDBACK = PRTO(000E) (R.C.=0004,REAS.=00000204) COPIES/RG VALUE
      MUST BE NUMERIC CHARACTERS
STATUS CODE = AS
```

For this example, the COPIES parameter has the incorrect value 'RG' specified as one of its operands. The error message indicates that the values for these operands must be numeric.

```
CALL = CHNG
      00
OPTIONS LIST = IAFP=A00,PRTO=0AXYZ(018)
FEEDBACK = PRTO(000E) (R.C.=0004,REAS.=000000D0) XYZ
STATUS CODE = AS
```

This example includes an invalid PRTO operand. The resulting reason code of X'000000D0' indicates that the operand shown (XYZ) is invalid.

## Debugging and diagnostic aids provided by IMS Spool API

In addition to providing feedback related to parsing errors, the IMS Spool API also provides other aids you can use in your diagnosis.

While debugging suspected problems with either the IMS Spool API or the application using the support, keep in mind that multiple services are involved in providing the total environment. Certain JES specifications might affect which options and specifications can be used by the IMS Spool API on behalf of an application program.

### Internal trace table

Each dependent region that uses the IMS Spool API creates a trace table that is used to trace module flow and significant events during IMS Spool API processing. This trace table is of the internal wrap around type, is always active for IMS Spool API functions, and cannot be written to an external device. It appears in any dumps that are produced by the dependent region. The first four words of the trace table are the header and contain the following information.

#### Word one

This is the trace table eye catcher. The eye catcher is IWB.

#### Word two

This is the offset from the beginning of the trace table (that is, trace table header) to the last entry traced. Since the entry is an offset, relocation of the trace table does not affect the use of this word to obtain the address of the last trace entry. The offset value is added to the relocated trace table address to obtain the last trace entry. If the value is zero, no entries have been traced.

#### Word three

This is the offset from the beginning of the trace table (the header) to the last trace entry in the table.

#### Word four

Reserved.

## Log records produced by the IMS Spool API

The IMS Spool API produces log records to record the significant events during IMS Spool API processing. A log record of the type X'68' is written for each data set that is opened. This log record contains the information necessary for identification of the data set. If any significant event occurs during spool processing, a diagnostic log record, 67D0 is produced to record diagnostic information about the error or event. The writing of the 67D0 records is normally associated with the DFS0013E message sent to the IMS MTO for these errors.

### Special abend processing

The IMS Spool API places control blocks in both extended common storage area (ECSA) and dependent region private storage. When a dependent region dump is produced, and IMS abnormal termination routines are allowed to execute, the following control block relocation is performed to provide diagnostic information in the dependent region dump.

The master control block for the dependent region and any active data set control blocks in ECSA are copied to the dependent region. These control blocks are copied without modification and the ECSA address of each print data set control block, IAFPDCB, is appended to the front of each relocated block.

A dummy module, DFSIAFD0, is loaded into the dependent region to serve as a place holder for the addresses of the relocated IMS Spool API control blocks. Obtain the address of module DFSIAFD0 by checking the dependent regions Job Pack Queue for the Contents Directory Entry (CDE) that represents module DFSIAFD0. The first three words of this dummy module contain the address of the relocated control blocks as follows.

#### Word one

This is the address of the relocated master control block (IAFPMCB) for the dependent region. The ECSA address of the master control block is appended in front of the relocated control block area. The eye catcher for the block is IAFPMCB.

#### Word two

This is the address of the first relocated IMS Spool API data set control block for a print data set (IAFPDCB). When this block is copied to the dependent region, the ECSA address of the original block is appended to the front of the relocated block. This is so that the chaining of the blocks can be verified. Any additional IAFPDCB control blocks are relocated following the first relocated block with the ECSA address of each block appended to the front of each relocated block. The eye catcher for the block is IAFPDCB.

#### Word three

This is the address of the trace table for the IMS Spool API. The eye catcher for the trace table is IWB.

### Service error log record 67D0

The IMS Spool API creates Service Error log records, log record type 67D0, whenever a service error or unexpected condition is encountered. The 67D0 log record contains the service in error and detailed information about the system status at the time the error is detected. When problem determination is being attempted for suspected IMS Spool API errors, obtain the 67D0 log records from the IMS systems log. If the IMS Spool API issues message DFS0013E, a service error log record is also written.

In addition to the errors reported through message DFS0013E, service error log records are written if the IMS Spool API code encounters inconsistent control block structures or is unable to properly process print data sets during abend processing. These service error log records are printed using the File Select and Formatting Print utility (DFSERA10).

Some examples of events that cause service error log records 67D0 to be produced are:

- Error during storage obtain/free
- Open or Close errors
- Allocation or deallocation errors
- Errors during Output Descriptor processing
- BSAM write errors

- Invalid IAFP Control Block encountered
- Unable to process print data sets due to abending dependent region
- OTMA experiences a severe internal error or rejects a synchronous callout ICAL call from an IMS application

The writing of these service error log records occurs automatically.





---

## Chapter 12. DRA - Database Resource Adapter service aids

In a Database Control (DBCTL) environment, if you think the coordinator controller (CCTL) did not cause the problem, then start your analysis here.

This section provides service aids and tips that can help you analyze problems in a Database Control (DBCTL) environment.

The DRA is the interface between DBCTL and the CCTL. The functions of the DRA are to:

- Request connection to and disconnection from DBCTL.
- Tell the CCTL when DBCTL has failed or when the operator has requested a shutdown.
- Manage threads.

### DRA dumps

---

The DRA creates a dump when a DRA request fails or when DRA processing fails. A DRA request failure produces either a system abend or an IMS pseudoabend. A DRA processing failure produces a system abend.

For either type of failure, the DRA first tries to create a z/OS SDUMP. If that fails, the DRA creates a SNAP dump. In some situations, the DRA creates a SNAP dump without attempting to create an SDUMP. For certain types of pseudoabends, the DRA creates neither an SDUMP nor a SNAP dump.

To determine what type of dump the DRA created, check field PAMPLRETC in the DFSPAPL (the parameter list that passes information between the CCTL and the DBCTL). The field PAMPLRETC has the format *hhssuuu*, where *hh* indicates the type of dump.

The following table shows the values for *hh* and indicates which dumps the DRA creates for different types of failures.

---

*Table 125. Determining the type of dump created by the DRA*

---

| hh    | Type of dump  | Failures                                                                                                                                                                                                                                                             |
|-------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'80' | SDUMP or SNAP | An SDUMP is created for all IMS abend codes not listed in this table, and for all z/OS abend codes that can be retried. If the SDUMP fails, a SNAP dump is created.                                                                                                  |
| X'84' | SNAP          | A SNAP dump is created for IMS abend codes U0260, U0261, and U0263.                                                                                                                                                                                                  |
| X'88' | No            | No SDUMP or SNAP dump is created for the following codes: <ul style="list-style-type: none"><li>• IMS abend codes U0775, U0777, U2478, U2479, U3303</li><li>• z/OS abend codes that can be retried (for example, S222 and S13E)</li><li>• DRA return codes</li></ul> |

---

### DRA SDUMP output

The DRA creates a dump when a DRA request fails or when DRA processing fails. The DRA first tries to create a z/OS SDUMP.

DRA SDUMP output contains:

- IMS control region
- DLISAS address space

- Key 0 and key 7 CSA
- Selected parts of DRA private storage, including the address space control block (ASCB), task control block (TCB), and request blocks (RBs)

A DRA SDUMP has its own SDUMP option list. To add to the SDUMP option list of a DRA, you can use the CHNGDUMP parameter. However, you cannot use the CHNGDUMP parameter to delete areas from the list.

You can format the IMS control blocks by using the Offline Dump Formatter (ODF). The ODF does not format DRA storage. You can use IPCS to format the z/OS blocks in the private storage of the CCTL.

## SNAP dump output

The SNAP dump data sets are dynamically allocated whenever a SNAP dump is needed. A parameter in the DRA startup table defines the SYSOUT class.

SNAP dump output contains:

- Selected parts of DRA private storage, including the address space control block (ASCB), task control block (TCB), and request blocks (RBs)
- Thread blocks of the DBCTL

## Recovery tokens

In a DBCTL environment, you need to correlate the information that is produced by the CCTL with information that is produced by the DBCTL. The link between the CCTL and DBCTL is the recovery token, which uniquely identifies each unit of recovery (UOR).

### Recovery token details

The recovery token appears in the DRA dump (both SDUMPs and SNAP dumps) and in the dump title. The recovery token contains a mixture of EBCDIC and hexadecimal data as shown:

#### CCTL subsystem ID 8 bytes (EBCDIC)

Unique UOR ID (created by the CCTL) 8 bytes (hexadecimal)

## Analyzing DRA problems

---

To analyze DRA problems, first investigate any external conditions that might have caused the problem. If you can eliminate external causes, an unexpected DBCTL return code or another IMS function might have caused the problem.

Follow these steps to analyze the problem.

### 1. Did external conditions cause the problem?

- For CCTL external problems, check the status of applications or transactions. DBCTL and the DRA do not control these resources.
- For DBCTL external problems, check the status of databases, PSBs, and dependent regions (BMPs and CCTLs) by using the **/DISPLAY** commands.
- For DRA external problems:
  - Make sure you are using the correct DRA startup table for this DBCTL/CCTL session. Values such as Fast Path buffer allocations and minimum/maximum thread specifications can cause scheduling and resource problems.
  - Become familiar with the CCTL control exit.

The DRA calls the control exit to notify the CCTL of certain events, such as a DRA failure, an identify failure, a DBCTL failure, and so on. The DRA passes this information in a parameter list (DFSPAPL). The CCTL responds by passing back a return code in field PAPLRETC to tell the DRA what action to perform. Understanding which actions the CCTL is allowed to request can help you distinguish between valid actions and failures.

- The DRA does not issue any messages that report the actions it performed.
  - If an external condition caused the problem, stop here and fix the problem. Otherwise, continue with the next step.
2. You reach this point by eliminating external reasons as the cause of the problem.
- Determine if DBCTL returned a nonzero return code, indicating that the request from the CCTL was not successfully completed.
- If yes, take a z/OS online dump of the CCTL and contact IBM Software Support.
  - If no, then other functions might be involved in the problem. Use the appropriate section in this information to analyze the problem. Keyword procedures are useful in narrowing the problem to a specific cause.

To determine the source of problems in a DBCTL environment, create a dump of the CCTL address space. Dumps that are produced by SDUMP and by specifying the DUMP option on the CCTL **/SHUTDOWN** command are acceptable for problem diagnosis. If IBM Software Support needs to analyze the CCTL dump, send the unformatted dump so that they can obtain DBCTL DRA storage.

### **Related concepts**

[“Selecting the keywords” on page 32](#)

You select the proper keywords to search the IBM Software Support database for a problem similar to the one you are experiencing. The keywords you select depend on the component that is experiencing the problem and the type of failure that occurred.



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## Chapter 13. FP - Fast Path service aids

Service aids for Fast Path include diagnosis, control interval, external trace, and locating control blocks.

### Diagnosing Fast Path problems

---

Before diagnosing problems in Fast Path, you must understand the structure of its dumps, especially the dependent region dumps.

When a dependent region abends, the structure of the dump varies, depending on a number of conditions. For example, if you requested and were able to perform offline dump formatting, the structure of the dump is different than if you had not requested offline dump formatting. Furthermore, if the dependent region that abends is an MPP executing in mixed mode, the structure of the dump might be different from that of an IFP region. The recommended approach is to request and use the offline dump formatting option.

#### ABENDU1026 analysis

To analyze ABENDU1026 failures, you determine the documentation to obtain, and how to find and interpret diagnostic data from the documentation. Gather the necessary data before searching an IBM Software Support database or calling the IBM Software Support.

Several modules issue ABENDU1026 to indicate conditions that should not occur. The dependent region abends, but the IMS control region continues processing. Message DFS2712I accompanies ABENDU1026.

This analysis is based on using a dump that you can format with the Offline Dump Formatter (ODF). The following tables describes where to find ODF information.

---

*Table 126. Locating information about the Offline Dump Formatter (ODF)*

---

| <b>For information about</b>                           | <b>Refer to</b>                                                        |
|--------------------------------------------------------|------------------------------------------------------------------------|
| Obtaining dumps that are suitable for input to the ODF | <a href="#">“Input for the IMS Offline Dump Formatter” on page 561</a> |
| Running the ODF                                        | <i>IMS Version 14 Database Utilities</i>                               |
| Using the ODF to solve problems                        | <a href="#">“Formatting IMS dumps offline” on page 560</a>             |

---

Before beginning the analysis, you need the following information:

- A copy of the DFS2712I message
- A dump formatted by the ODF
- A copy of *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*

If an authorized program analysis report (APAR) is necessary, you might also need the following information:

- The last successful image copy of the database encountering the problem
- The IMS logs from the time of the last successful image copy to the point of failure
- A copy of the Fast Path trace, if Transaction Retry was invoked

The following example procedure takes you through the analysis of an actual ABENDU1026 until you have collected enough data to search an IBM software support database or call the IBM Support Center.

This example procedure uses the sample message DFS2712I in the following figure. Message DFS2712I is sent to the console. Save a printed copy of the message.

```

DFS2712I  MODULE NAME:   DBFMRCU0
DFS2712I  ABEND SUBCODE: 0053
DFS2712I  AREA NAME:    DB21AR0

DFS2712I  MLTE:
DFS2712I  02A923BC  02919E60  00000000  00000000  00001008
DFS2712I  02A923CC  02903310  00005A08  00001008  00040400
DFS2712I  02A923DC  03018000  001C0008  029328B4  00060000
DFS2712I  02A923EC  00000000  00000000  00000000  02A92178
DFS2712I  02A923FC  02A92470  0072F70A  00000000  40800000
DFS2712I  02A9240C  00000000  00000000  00000000  00000000
DFS2712I  02A9241C  00000000  00000000  00060000  00000000
DFS2712I  02A9242C  00000000

DFS2712I  BUFFER CONTENTS:
DFS2712I  02919E58  016C0802  40000000  99000000  5C08015E
DFS2712I  02919E68  C1C140E3  C8C9E240  C9E240E3  C8C540C6
DFS2712I  02919E78  C9D9E2E3  40F3D9C4  40D3C5E5  C5D340E2
DFS2712I  02919E88  C5C7D4C5  D5E34040  40404040  40404040
DFS2712I  02919E98  40404040  40404040  40404040  40404040
. . . . .
DFS2712I  R0-R3   00000008  00000053  02919E60  02A92010
DFS2712I  R4-R7   02A923BC  008138D4  00000008  00005A00
DFS2712I  R8-R11  00000004  02903310  0070B040  0086DF20
DFS2712I  R12-R15 00818BA0  0070767C  80818C62  00000018

```

Use the following steps to analyze ABENDU1026:

1. Locate the module name and subcode associated with the abend. This information appears in the first few lines of message DFS2712I.

In the previous example, the module name is DBFMRCU0 and the subcode is 0053.

2. To find the meaning of the subcode, look up ABENDU1026 in *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes*. Find module DBFMRCU0 and subcode 0053.

The description of subcode 0053 is: MLTE segment code (Reg4 + X'1E') is not equal to the DSEGCODE of the segment pointed to by register 2.

This means that the segment code in field MLTESGCD in MLTE (a Fast Path control block) does not match the segment code of the segment in the buffer (DSEGCODE). Therefore, your next step is to determine what the mismatched values are.

3. Check *IMS Version 14 Messages and Codes, Volume 3: IMS Abend Codes* again to determine which registers you must examine.

The important registers are:

Register 8 = MLTESGCD

Register 2 = Address of the segment; DSEGCODE is the first byte

In the previous example, the register contents appear at the bottom of message DFS2712I.

4. Use the registers and the buffer contents in the message to compare the segment code in the segment in the buffer (DSEGCODE) with the segment code in field MLTESGCD in the MLTE. These codes must match.

- Register 8 contains the segment code from field MLTESGCD in the MLTE. In the example, register 8 has a value of 00000004.
- Register 2 contains the address of the segment in the buffer. The first byte of the segment is the segment code (DSEGCODE). In the example, DSEGCODE has a value of 99.
- Because the segment code from the MLTE (04) does not match the segment code of the segment (99), ABENDU1026 occurred.

There are several ways to find this data. To find the segment code in field MLTESGCD in MLTE, you can also use register 4 + X'1E'. To find the DSEGCODE, you can also use register 6 (00000008), which is the offset in the buffer to the DSEGCODE.

5. Look at the module save area set to determine the module flow leading to the abend. You can use the Offline Dump Formatter (ODF) to format the save area set in a dump by specifying FMTIMS DB,MIN.

- Register 13 in message DFS2712I contains the address of the save area for the PST that suffered the abend.
- In the example message in the previous example, register 13 contains the address 0070767C.
- In the \*\*DPST section of the formatted dump in the following example, search for a save area (SA) with address 0070767C. If you are searching online, the second occurrence you find is the save area.

```

***SAVE AREA SET***
EP  DBFMCLX005/06/8804.27PL24768 ABCD
SA  0070755C      WD1 8071B310      HSA 80000000      LSA 007075A4      RET 8088070E      EPA 00812FE0
R0  00000519
R6  00000000      R1 8071B310      R2 C7D5D740      R3 02A92010      R4 0001A000      R5 00707050
R7  8072F624      R8 00707050      R9 0072F6CC      R10 0070B040      R11 0086DF20
R12 00880042
EP  DBFMGNX003/03/8820.09PL22770 AB
SA  007075A4      WD1 00000000      HSA 0070755C      LSA 007075EC      RET 808131A0      EPA 00814528
R0  00000519
R6  FFFFFD80      R1 8071B3AB      R2 C7D5D740      R3 02A92010      R4 02A92090      R5 008138D4
R7  FEE06FD4      R8 00707050      R9 0072F6CC      R10 0070B040      R11 0086DF20
R12 00812FE0
EP  DBFMUG005/11/8800.59PL26682 ABCDE
SA  007075EC      WD1 00000000      HSA 007075A4      LSA 00707634      RET 8081466A      EPA 00816900
R0  00000519
R6  FFFFFD80      R1 8071B3AB      R2 00000000      R3 02A92010      R4 02A92178      R5 008138D4
R7  FEE06FD4      R8 00707050      R9 0072F6CC      R10 0070B040      R11 0086DF20
R12 00814528
EP  DBFMRCU003/21/8618.02PT01119 0
SA  00707634      WD1 00000000      HSA 007075EC      LSA 0070767C      RET 80816ABE      EPA 00818BA0
R0  00000519
R6  FFFFFD80      R1 8071B3AB      R2 02A92178      R3 02A92010      R4 02A923BC      R5 008138D4
R7  00005A08      R8 0291AE66      R9 0072F6CC      R10 0070B040      R11 0086DF20
R12 00816900
EP  DBFMUG002/04/8617.58PP35272 1B
SA  0070767C      WD1 00000000      HSA 00707634      LSA 007076C4      RET 80818C62      EPA 00818FD8
R0  00000008
R6  00000008      R1 8071B3AB      R2 02919E60      R3 02A92010      R4 02A923BC      R5 008138D4
R7  00005A00      R8 00000004      R9 02903310      R10 0070B040      R11 0086DF20
R12 00818BA0
EP  DBFMSRB002/13/8716.56PP58251 AB
SA  007076C4      WD1 00000000      HSA 0070767C      LSA 0070770C      RET 80822377      EPA 008285F0
R0  FFFF4040
R6  00005A00      R1 02903310      R2 02932A08      R3 02903278      R4 808222E0      R5 00822638
R7  00BBCF78      R8 02932A08      R9 02903310      R10 0070B040      R11 0086DF20
R12 008221B8
EP  DBFXSL3007/08/8819.02PL28384 AB
SA  0070770C      WD1 00000000      HSA 007076C4      LSA 00707754      RET 808286D7      EPA 00823D38
R0  00000000
R6  00005A00      R1 0070B040      R2 02932A70      R3 02903278      R4 02903310      R5 0071A250
R7  00BBCF78      R8 02932A08      R9 02903310      R10 0070B040      R11 0086DF20
R12 008285F0

```

6. In the example above, the module flow, reading from the top down, is DBFMCLX0, DBFMGNX0, DBFMUG0, and DBFMRCU0, which is where the abend occurred. Notice that other modules follow DBFMRCU0 in the flow. You can ignore these modules now. However, they might be important later in the problem analysis.

7. Information from other sources might help you while searching the IBM software support database or talking with the IBM Support Center representative.

If an MPP or an IFP received the ABENDU1026, the Transaction Retry function should have retried the transaction.

Look in your MTO log for messages DFS0663I, DFS0784I, DFS0785I, DFS0787I, and other messages associated with a retry to find out what happened.

After you complete these steps, you have most of the following information:

- The abend code (ABENDU1026).
- The subcode (SUBCODE053).
- The module name (DBFMRCU0).
- The save area flow leading to the abend.
- The field in error (MLTESEGCD or DSEGCODE). You might not be sure which field is incorrect.
- Any messages produced by a transaction retry (for example, MSGDFS0663I).

With this information you are ready to search the database or contact IBM Software Support.

### **Related concepts**

[“Input for the IMS Offline Dump Formatter” on page 561](#)

The dump data set you use for input to the IMS Offline Dump Formatter must include Key 0 and Key 7 CSA, the CVT, and SQA. CSA is not required for batch or CICS-local DL/I. The dump must be machine readable.

[“Formatting IMS dumps offline” on page 560](#)

Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

## **Fast Path Transaction Retry**

Fast Path Transaction Retry (FPTR) is designed for IMS Fast Path users who cannot run the Fast Path trace permanently on their system because of its impact on performance, but want to have the trace turned on when Fast Path failures occur.

Fast Path problems can be resolved much faster when trace information is available to show the logic flow of a call or transaction.

FPTR is activated only when certain Fast Path failures occur. FPTR automatically allocates a trace data set, turns on the trace, and retries the transaction. If no abend occurs on the retry, FPTR issues a message, turns off the trace, and the system continues processing. If an abend does occur on the retry of the transaction, Fast Path trace writes the trace data, FPTR turns off the trace, and the system continues with Fast Path trace inactive. FPTR is not invoked for abends in BMP regions.

When you report certain IMS Fast Path problems to the IBM Support Center, you will be asked if the Transaction Retry function failed. The following topics will help you determine what information to report.

### **Processing flow**

A summary of the processing flow of FPTR follows:

- The ESTAE exit of the dependent region controller receives control for abends U1026 and U1027, and all system abends except 122 and 222.
- The ESTAE exit provides debugging information including:
  - Name of abending module
  - Last applied APAR of the abending module
  - Date and time of assembly of module

If the failing module cannot be identified, a message informs the operator.

- The ESTAE exit decides if the transaction can be retried. If so, the ESTAE requeues the failing input message for retry and produces a dump of the first abend.
- Message DFS554A is sent to the master terminal.
- The retry process starts in an eligible dependent region.
  - FPTR dynamically allocates a trace data set and starts Fast Path trace.



- FPTR writes message DFS0785A to the master terminal and the JES2 job log.
- When the retry of the transaction is complete, FPTR deallocates the trace data set and spools the contents of the trace data set to the SYSOUT class specified in the MSGCLASS parameter on the JOB statement of the dependent region.

### System programmer tasks

The system programmer should:

- Print the job log.
- Print the spooled trace data set information.
- Save and analyze the above information.
- Contact IBM Software Support for assistance, if needed.

## DEDB control interval (CI) problem assistance aids

---

When you print portions of the DEDB, the control intervals (CIs) have these identifying characteristics.

After you have performed the analysis described in “[ABENDU1026 analysis](#)” on page 391, review the contents of the various control blocks. Included in message DFS2712I is a dump of the control block that is related to the logical inconsistency. This control block is in the format of one of the control intervals (CIs). You can (possibly with help from IBM Software Support) obtain the RBA of the affected CI from the buffer. You can then use this RBA:

- When you extract the CI from the image copy of the DEDB
- When you choose the criteria for selecting and printing the IMS log records (with DFSERA10)

The acronyms used in this topic are:

#### **DOVF**

Dependent overflow

#### **IOVF**

Independent overflow

#### **RAP BLOCK**

Root-anchor point block

#### **SDEP**

Sequential dependent

### CI type identification

Each CI has an identifier at X'02' in the CI, with the exception of the first and second CIs. The first is the IMS control CI and the second contains the DMAC control block for this area.

#### **CI Type**

##### **Identifier**

#### **REORG CI**

00

#### **RAP**

01

#### **DOVF**

02

#### **IOVF (SPACE MAP)**

04

#### **IOVF**

08

#### **SDEP**

10

## DEDB CI formats

These are the CI types and the data that is common to all CIs (except the SDEP CI).

### CI 0

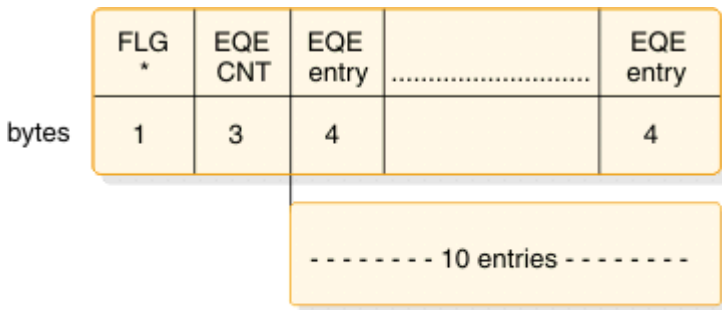
The IMS control CI.

|                       |                      |                       |                   |                        |               |            |    |
|-----------------------|----------------------|-----------------------|-------------------|------------------------|---------------|------------|----|
| 0                     | 8                    | 10                    | 18                | 1C                     | 20            | 28         | 32 |
| Creation<br>Date/Time | Restart<br>Date/Time | ERestart<br>Date/Time | RBA of<br>Last CI | Characters<br>DBF1.000 | Cisize<br>- 7 | Org<br>"D" |    |

### CI 1

The DMAC control block for this area is located here.

The Error Queue Element (EQE) list is also located in this CI. This list is 44 bytes long and immediately precedes the trailer information, (for example, CUSN, RBA, RDF and CIDF). The following figure shows the EQE list format: FLG (1 byte), EQE CNT (3 bytes), 10 available EQE entries (40 bytes).



\* A flag setting of X'80' indicates that there are more than 10 EQEs or an error in the second CI.

Figure 71. EQE list in CI 1

### RAP CI

The following figure shows the RAP CI.

|       |      |                                    |                           |
|-------|------|------------------------------------|---------------------------|
| 0     | 2    | 4                                  | 8                         |
| FSEAP | 0203 | RBA of current<br>overflow CI      | Segments, FSEs and Scraps |
|       | (02) | - Indicates CUSN<br>is in this CI. |                           |

### First DOVF CI

The first DOVF CI has the format shown in the following figure.

|       |      |                                                 |                           |
|-------|------|-------------------------------------------------|---------------------------|
| 0     | 2    | 4                                               | 8                         |
| FSEAP | 0203 | RBA of current<br>overflow CI                   | Segments, FSEs and Scraps |
|       | (02) | - Same as RAP CI -- these two bits combined     |                           |
|       | (01) | - Look here for space -- make the 03 in byte 3. |                           |

**Exception:** From here on, the key bits are shown, but byte 3 is not shown.

### Other DOVF CIs

All DOVF CIs except the first one have the format shown in the following figure.

|       |    |                                                              |                           |
|-------|----|--------------------------------------------------------------|---------------------------|
| 0     | 2  | 4                                                            | 8                         |
| FSEAP | 02 | RBA of next<br>DOVF CI with<br>space, last<br>contains zeros | Segments, FSEs and Scraps |

### First IOVF CI

The CI shown in the following figure is a space map and is the first in each group of 120 CIs. The 119 CIs that follow are data CIs.

```
0      2      4      6      8 (119 words mapping next 119 CIs)
0000   04   8000xxxx offset 8000xxxx free and offset to next free
                    to 1st 4000uow# allocated
                    free  2000uow# used by reorg
                    40000000 no free space in this space map CI
```

### Other IOVF CIs

The following figure is a data CI - 119 data CIs follow each space map CI.

```
0      2      4      8
FSEAP  0802  4000uow#  Segments, FSEs and Scraps (allocated,
0008   0802  80000000  to UOW number; 0 is the first UOW).
                    FSE (CI not allocated).

                    (02) indicates CUSN is in this CI
```

### SDEP CI

**Exception:** SDEP CIs do not contain FSEs and have no FSEAP or CUSN. User segments have a time stamp added at the end. The following figure shows the SDEP CI.

```
0      2 3      4      8
0000   1000  Partner name  Segments inserted sequentially
                    and cannot be updated

                    (01) - Time stamp exists
                    (04) - SDEP CI is full.
```

### FSEAP

FSEAP is the offset of the first FSE in the CI. Fast Path FSEs are chained from the highest RBA, in order, to the lowest RBA in the CI.

```
FSE---X'8offssss'  off=offset of next FSE in CI
                    ssss=size (length) of the free space
                    including the FSE.

X'8000ssss'  indicates this is the last FSE on the chain in
this CI.
```

If the CI is empty, the FSE is X'15' bytes less than the CI size, or X'13' less than the CI size if no CUSN exists. The RDF and CIDF are X'7' bytes less than the CI size. Here are some examples:

```
CI      512  X'200'  1024  X'400'  2048  X'800'  4096  X'1000'
```

|      |          |          |          |          |
|------|----------|----------|----------|----------|
| FSE  | 800001EB | 800003EB | 800007EB | 80000FEB |
| RDF  | 0001F9   | 0003F9   | 0007F9   | 000FF9   |
| CIDF | 01F90000 | 03F90000 | 07F90000 | 0FF90000 |

### Scraps

Scraps are less than 4 bytes. They begin with X'7n' if less than 8 segment types, or X'Fn' if more than 8. For example,

```
1 byte-X'71' or X'F1'
2 bytes-X'72' or X'F2'
3 bytes-X'73' or X'F3'
```

### Data Common to All CIs

The last X'0D' bytes of a CI all have the same use. The last line of a CI looks like this in a dump.

```
data  data  data  data  data
x-x   x-x   x-x   x-x   xxxxxxxx xxxxxxxx xxbbbbbb bbbbbbbb
                    -D -C-B-A-9 -8-7-6-5 -4-3-2-1
```

The bytes with bbbbbb do not print and will show as blanks in the dump. The fields from -D to -1 are:

|      |          |                                                                                                            |
|------|----------|------------------------------------------------------------------------------------------------------------|
| CUSN | -D,C     | These 2 bytes represent updates to the CI. The 02 bit in byte 3 of a CI indicates a CUSN exists in the CI. |
| RBA  | -B,A,9,8 | These 4 bytes are the beginning RBA of the CI.                                                             |
| RDF  | -7,6,5   |                                                                                                            |
| CIDF | -4,3,2,1 |                                                                                                            |

**Recommendation:** Use the RBA of the CI when you select log records to format and print with the DFSERA10 utility.

SDEP CIs do not contain FSEs and do not have a CUSN. SDEP CIs end at -B (the RBA). Data can occupy the space up to that location.

### Analyzing control interval (CI) contention

When CI contention occurs in a DEDB, Fast Path passes both lock requests to program isolation (PI) modules. The PI trace, if active, traces the locks. To format the PI trace records (log record type X'67FA'), use the File Select and Formatting Print utility (DFSERA10) with exit DFSERA40. For information about running this utility, see *IMS Version 14 System Utilities*.

Using the trace records, find the RBA field of the CI. The digits in the CI RBA field are shifted right 8 bits. For example, an RBA of 00468000 is displayed as 00004680.

You must translate the value in the DMB field to a relative DMAC number. (DMAC numbers are relative to the DATABASE definitions.)

For example, if the first DMAC is X'FFFE', the second DMAC is X'FFFD', the third DMAC is X'FFFC', and so on. Because databases are chained alphabetically in the DDIR, if the DMB field is X'FFF6', you calculate the relative DMAC number as follows:

$$X'FFFF' - X'FFF6' = X'19' = 25 \text{ (decimal)}$$

This calculation means that X'FFE6' is the 25th area relative to the first area of the first DEDB in the DDIR.

### Related reference

[“Log records” on page 515](#)

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

## Locating Fast Path control blocks and tables

Many of the Fast Path control blocks are extensions of IMS full-function control blocks. The names of these Fast Path control blocks are the same as in full-function.

The acronyms for these Fast Path control blocks start with "E."

### Example:

#### SCD

System Contents Directory (full-function IMS)

#### ESCD

Extended System Contents Directory (Fast Path)

To view the layout of the Fast Path control blocks for your system, assemble DFSADSCT from IMS.ADFSSMPL and use XREF(FULL).

The following table shows the Fast Path control blocks and work areas that appear as a load list in an IMS dump. This information is relevant when you are working on an abend U1011 in module DBFINI20. Message DFS2703A generally accompanies the abend. Abend U1011 results from either a GEN problem or a storage fragmentation problem.

Table 127. Fast Path control blocks and work areas that appear in IMS dumps

| Load list name | Fast Path block/work area        | Appearance in dump |
|----------------|----------------------------------|--------------------|
| DFSEPnnn       | Fast Path EPSTs<br>(nnn=000-999) | IMS STM task       |
| DBFCONT1       | ECNTs/MSDBs                      | IMS STM task       |
| DBFCONT3       | DMHRs/buffers                    | IMS STM task       |
| DBFCONT4       | DEDB blocks                      | IMS STM task       |
| DBFCONT5       | OTHEADs                          | IMS STM task       |
| DBFCONT6       | BALGs                            | IMS STM task       |
| DBFCONT7       | Miscellaneous buffers            | IMS STM task       |
| AREALIST       | AREA list                        | IMS STM task       |

At Fast Path initialization, modules DBFINI21, DBFINI23, DBFINI24, DBFINI25, DBFINI26, and DBFINI27 calculate the amount of contiguous ECSA storage that is needed to load the buffers, buffer headers, MSDBs, and other related control blocks into separate work areas named DBFCONTx.

If module DBFINI2x cannot obtain a large enough contiguous block of storage, abend U1011 is issued, along with an error message. When this abend occurs, you can restart IMS, or you can stop other jobs that might prevent module DBFINI2x from obtaining the necessary storage.

The following table describes the control block structures that are defined during IMS startup. This table can help you determine which control blocks are needed in your Fast Path environment.

Table 128. Control blocks that are allocated during IMS startup

| Control block/table                                                                    | With MSDB/<br>DEDB | Without<br>DEDB | Without<br>MSDB | Without MSDB/DEDB |
|----------------------------------------------------------------------------------------|--------------------|-----------------|-----------------|-------------------|
| ECNT DBFCONT1                                                                          | X                  | X               | X               | X                 |
| BHDR DBFCONT1                                                                          | X                  | X               |                 |                   |
| MSDB DBFCONT1                                                                          | X                  | X               |                 |                   |
| DMHR DBFCONT3                                                                          | X                  | X               | X               |                   |
| BUFF DBFCONT3                                                                          | X                  | X               | X               |                   |
| DEDB blocks (DMCBs,<br>DMACs, MRMBs,<br>segment names, and<br>field names)<br>DBFCONT4 | X                  |                 | X               |                   |
| OTHR DBFCONT5                                                                          | X                  |                 | X               |                   |
| BALG DBFCONT6                                                                          | X                  | X               | X               | X                 |
| LBUF DBFCONT7                                                                          | X                  | X               | X               | X                 |
| FPAL AREALIST                                                                          | X                  |                 | X               |                   |

## Locating IMS blocks and work areas by using load list elements

IMS loads IMS blocks and work areas using the IMS IMODULE facility. IMS generates a load list element from which you can obtain the unique name and location of each work area.

### Load list areas

Load list areas are areas that appear formatted as the load list in an IMS control region dump. Global areas are in the common storage area (CSA).

Table 129. Load list areas

| Load list name | IMS block/work area                                                             | Pool type                         |
|----------------|---------------------------------------------------------------------------------|-----------------------------------|
| DFSABSxx       | Abend Diagnostic Area, xx=PST number                                            | Global                            |
| DFSBFSP        | DL/I Buffer Handler Pool                                                        | Global                            |
| DFSBLK0x       | SCD, x=same as nucleus suffix                                                   | Global                            |
| DFSBWLOG       | BG Write Log Work Area                                                          | Local                             |
| DFSCBTHD       | Control block table header that points to the storage pools defined in DFSCBT00 | Global <sup>"1"</sup> on page 402 |
| DFSCBT10       | Storage pool headers for the pools defined in DFSCBT00                          | Global <sup>"1"</sup> on page 402 |
| DFSDLWxx       | Retrieve Work Area, xx=PST number                                               | Global                            |
| DFSDMBRS       | Resident DMBs                                                                   | Global                            |
| DFSDSET        | OLDS Data Set Entry Table                                                       | Local                             |
| DFSEOVOS       | OSAM DCB Work Area                                                              | Global                            |
| DFS01FXL       | Fixlist for OSAM I/O Driver                                                     | Local                             |
| DFSINTRS       | Resident Intent Lists                                                           | Global                            |
| DFSIPB         | Initialization Parameter Block                                                  | Local                             |
| DFSISIT        | Ident Table and ISI Storage                                                     | Global                            |
| DFSLCD         | Logger LCD                                                                      | Global <sup>"2"</sup> on page 402 |
| DFSLCDST       | IMS Monitor Logger LCD                                                          | Global                            |
| DFSLLOG        | X'06' and X'42' Log Records                                                     | Local                             |
| DFSLOCP        | Storage Management Local Pool                                                   | Local                             |
| DFSLOGxx       | Log Work Area, xx=PST number                                                    | Global                            |
| DFSLXBC        | Link Extension Blocks for MSC CTC                                               | Global                            |
| DFSLXBM        | Link Extension Blocks and I/O Buffers for MSC MTM links                         | Global                            |
| DFSMFDDH       | MFS Pool Dynamic Directory Hash Table                                           | Local <sup>"4"</sup> on page 402  |
| DFSMFDDP       | MFS Pool Dynamic Directory Prime Area                                           | Local <sup>"4"</sup> on page 402  |
| DFSMFDD0       | MFS Pool Dynamic Directory Entry Area                                           | Local <sup>"4"</sup> on page 402  |
| DFSMFPDS       | MFS Pool PDS Directory Indexes                                                  | Local <sup>"4"</sup> on page 402  |
| DFSMFSTG       | MFS Pool Staging Buffers                                                        | Local <sup>"4"</sup> on page 402  |
| DFSMTCLB       | CLB (ECB) for DFSCMTIO                                                          | Global                            |

Table 129. Load list areas (continued)

| <b>Load list name</b> | <b>IMS block/work area</b>                             | <b>Pool type</b>                  |
|-----------------------|--------------------------------------------------------|-----------------------------------|
| DFSMTIOT              | Monitor TIOT Table                                     | Global                            |
| DFSMTMH               | MSC Main Storage-to-Main Storage Queue Header          | Local <sup>"3"</sup> on page 402  |
| DFSMTMW               | MSC Main Storage-to-Main Storage Window                | Local <sup>"3"</sup> on page 402  |
| DFSOFPL               | OSAM Buffer Pool                                       | Global <sup>"2"</sup> on page 402 |
| DFSOFWA               | OSAM Buffer Pool Work Area                             | Local                             |
| DFSOLRnn              | OLDS Read DCB where nn must be numeric                 | Local                             |
| DFSOSDEB              | OS/VS2 "Fake" OSAM DEB                                 | Global                            |
| DFSPCWAP              | Communications Work Pool                               | Local                             |
| DFSPDBWP              | Database Work Pool                                     | Global                            |
| DFSPDMB               | DMB Pool                                               | Global                            |
| DFSPFBP               | MFS Pool                                               | Local                             |
| DFSPFWA               | Prefetch Work Area, ECB and Save Sets                  | Local                             |
| DFSPPSBW              | PSB and PSB Work Pool                                  | Global                            |
| DFSPQBUF              | Queue Manager Buffers                                  | Local                             |
| DFSPSBR               | Resident PSBs                                          | Global                            |
| DFSPSTQE              | Scheduler Sequence Queue                               | Global                            |
| DFSPSTxx              | SAP Work Area, xx=PST number                           | Global                            |
| DFSPTPDB              | Communications Pool                                    | Local                             |
| DFSPWKAP              | Working Storage General Pool                           | Global <sup>"2"</sup> on page 402 |
| DFSRSTEB              | Restart ECB and Save Sets                              | Local                             |
| DFSRSTWA              | Restart Work Area                                      | Local                             |
| DFSSBBUF              | Sequential buffering: SBUF                             | Local                             |
| DFSSBCA1              | Sequential buffering: SCAR                             | Global                            |
| DFSSBDCB              | Sequential buffering: SDCB                             | Local                             |
| DFSSBDSE              | Sequential buffering: EDSG                             | Local                             |
| DFSSBDSG              | Sequential buffering: SDSG                             | Local                             |
| DFSSBITA              | Sequential buffering: ITASK storage for overlapped I/O | Global                            |
| DFSSBPSS              | Sequential buffering: SBPSS                            | Global                            |
| DFSSBPST              | Sequential buffering: SBPST                            | Local                             |
| DFSSBRAN              | Sequential buffering: SRAN                             | Local                             |
| DFSSBSBU              | Sequential buffering buffers                           | Local                             |
| DFSSBSCD              | Sequential buffering: SBSCD                            | Global                            |
| DFSSBWO               | Sequential buffering: DFSSBWO                          | Local                             |
| DFSSLX                | SCD Latch Extension                                    | Global                            |

Table 129. Load list areas (continued)

| Load list name | IMS block/work area                                   | Pool type                         |
|----------------|-------------------------------------------------------|-----------------------------------|
| DFSSSCT        | Subsystem Control Table                               | Local <sup>"3" on page 402</sup>  |
| DFSSTAEB       | STAE Work Area                                        | Local                             |
| DFSSTPEB       | Stop Region ECB, Save Sets and Work Area              | Local                             |
| DFSSTPWA       | Stop Region Message Work Area                         | Local                             |
| DFSTRMWK       | Modify/Terminate Task Save Sets, ECB and Work Area    | Local                             |
| DFSTSAV        | Temporary Save Sets                                   | Local                             |
| DFSVRFXL       | Fixlist for EXCPVR                                    | Local                             |
| DFSXCWxx       | Exclusive Control Enqueue/Dequeue Work Area, xx=01-99 | Global <sup>"2" on page 402</sup> |
| DFSZIBxx       | ZIB/FAQE Pool, xx=01-99                               | Global                            |

**Notes:**

1. A large number of storage pools are defined in module DFSCBT00. The contents directory element (CDE) name for storage in a given control block table (CBT) pool is #xxxxyyy, where xxxx is the pool name, and yyy is a number from 001 to 999. See [Table 130 on page 402](#) for a description of the CBT pools.
2. When you use the local storage option (LSO), all these areas are obtained from local storage. When you use Fast Path and LSO, DFSLCD, DFSDBUFF, and DFSXCWxx remain in global storage. When you select LSO = S, DFSLCD and DFSPWKAP remain in global storage.
3. IMS constructs these areas at abend time. They consist of copies of the subject areas preceded by one word containing the original address of the area.
4. IMS builds these areas in extended private storage.

**Control block table pools**

Modules DFSBCB00, DFSBCB30, and DFSBCB90 support get/release requests for blocks in specific storage pools, referred to as 'CBT' pools.

Table 130. CBT pool names and descriptions

| CBT pool | Description                                              |
|----------|----------------------------------------------------------|
| AHDR     | Autologon LU headers                                     |
| ADSC     | Fast Path DEDB area data set control block               |
| AESL     | Fast Path DBRC parameter area                            |
| AWE      | Work-to-do element for task communication                |
| BCPT     | Checkpoint ID table                                      |
| BQEL     | Used when a buffer is altered and released at sync point |
| BXQE     | Storage manager queue elements                           |
| CBLK     | LU 6.2 CPI communications driven control block           |
| CCB      | Conversational control block                             |
| CLLE     | Common latch list element                                |
| CMWU     | Save sets/ECB for ITASKs which do not require a PST      |



Table 130. CBT pool names and descriptions (continued)

| <b>CBT pool</b> | <b>Description</b>                                                                                                                                                                      |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSAG            | Callable services anchor block (ECSA storage)                                                                                                                                           |
| CSAL            | Callable services anchor block (E-private storage)                                                                                                                                      |
| DBPB            | Database purge block                                                                                                                                                                    |
| DBRC            | DBRC work area                                                                                                                                                                          |
| DDIR            | Database directories                                                                                                                                                                    |
| DDRE            | DMB directory extension                                                                                                                                                                 |
| DESC            | LU 6.2 descriptor block                                                                                                                                                                 |
| DG2W            | Dispatcher work area section 2 (global storage)                                                                                                                                         |
| DL2W            | Dispatcher work area section 2 (local storage)                                                                                                                                          |
| DPST            | Dependent region PST: The following blocks are associated with the dependent region structure:<br><br>D1WA, DG2W, EPST, FSRB, GQMW, IDT, IOSB, IRLM, KLSL, LCRE, SAP, SLOG, STTR, XPST. |
| D1WA            | Dispatcher work area section 1                                                                                                                                                          |
| EPST            | Fast Path PST extension                                                                                                                                                                 |
| EQEL            | Recoverable in doubt structure queue elements                                                                                                                                           |
| EZS             | External subsystem storage                                                                                                                                                              |
| FEIB            | Front-end message switch interface block                                                                                                                                                |
| FNCB            | Used by Fast Path for global command notifies                                                                                                                                           |
| FPB6            | Fast Path 64-bit buffer manager pool                                                                                                                                                    |
| FPCP            | Used by Fast Path for local commands                                                                                                                                                    |
| FSRB            | Fast Path wake up/sleep SRBs                                                                                                                                                            |
| GESE            | Represents a defined external subsystem                                                                                                                                                 |
| GIOB            | IOB for batch                                                                                                                                                                           |
| GOWA            | OSAM channel programs for batch                                                                                                                                                         |
| GQMW            | Global queue manager work area                                                                                                                                                          |
| GS24            | Global 24-bit save area                                                                                                                                                                 |
| GSAV            | Global save area                                                                                                                                                                        |
| IAFP            | IMS advanced future print block                                                                                                                                                         |
| IDT             | Block used to keep track of identified regions                                                                                                                                          |
| IEQE            | In-flight/in-doubt data buffers                                                                                                                                                         |
| IOSB            | I/O supervisor block for OSAM                                                                                                                                                           |
| IRLM            | Dependent region block, if IRLM is used                                                                                                                                                 |
| KLSL            | LSO=X,Y block for each dependent region                                                                                                                                                 |
| LCLL            | Local common latch list element (E-private storage)                                                                                                                                     |

Table 130. CBT pool names and descriptions (continued)

| <b>CBT pool</b> | <b>Description</b>                                     |
|-----------------|--------------------------------------------------------|
| LCRE            | Local Recovery element (persists across restart)       |
| LG24            | Below the 16MB line dynamic SAP save sets              |
| LGND            | Block used to hold logon descriptor representations    |
| LGWA            | Log work area                                          |
| LGWX            | Log work area extension (private)                      |
| LPST            | PSTs for IMS internal use in local storage             |
| LQB             | Local queue block (SPQBs and CNTs)                     |
| LQMW            | Local queue manager work area                          |
| LS24            | Local 24-bit save area                                 |
| LSAV            | Dynamic SAP save sets                                  |
| LUB             | LU 6.2 LU block                                        |
| L56X            | Fast Path database control log record                  |
| MSGP            | Message buffers in global storage                      |
| OLRK            | OLR database block                                     |
| OSWA            | OSAM channel program areas                             |
| PCIB            | MFS Partition CIB                                      |
| PDIR            | Program directories                                    |
| PF62            | LU 6.2 message prefix block                            |
| PST             | PSTs for IMS internal use in global storage            |
| QAB             | LU 6.2 queue anchor block                              |
| QMBA            | Queue manager global buffer area                       |
| QSAV            | Save sets with AWEs                                    |
| RACW            | RACF workarea                                          |
| RCNT            | Remote communication name table                        |
| RCTE            | Fast Path routing codes                                |
| RECA            | VTAM receive any buffers                               |
| RPST            | Restart PST                                            |
| RRE             | Represents an active thread to an external subsystem   |
| SAP             | Save area prefix – Includes fixed and dynamic SAPs     |
| SIDX            | One for each identified external subsystem             |
| SLOG            | IMS Monitor parameter area block                       |
| SMB             | Scheduler message blocks                               |
| SOPB            | Sign-on parameter list block                           |
| SRBC            | Common SRBs used for data sharing asynchronous NOTIFYs |

Table 130. CBT pool names and descriptions (continued)

| CBT pool | Description                                                                  |
|----------|------------------------------------------------------------------------------|
| STAT     | Database Control (DBCTL) and Database Resource Adapter (DRA) statistics area |
| STTR     | Retrieve trace area                                                          |
| SVPG     | System service parameter list block (global-ECSA)                            |
| SVPL     | System service parameter list block (local-private)                          |
| TCBT     | TCB table                                                                    |
| TIB      | LU 6.2 transaction instance block                                            |
| TTAB     | Trace table (31-bit storage)                                                 |
| TT24     | Trace table (24-bit storage)                                                 |
| USMU     | Security block                                                               |
| USRD     | Blocks used to represent user control block structure                        |
| UXIC     | User exit instance blocks in common storage                                  |
| UXIP     | User exit instance blocks in private storage                                 |
| UXSC     | User exit static work area in common storage                                 |
| UXSP     | User exit static work area in private storage                                |
| VRPL     | VSAM RPL with two save areas                                                 |
| VTCB     | VTAM terminal control blocks                                                 |
| VWA      | Volatile work area                                                           |
| WLMB     | Work area of parameter list for the Workload Manager classification service. |
| XMCI     | Cross memory ITASK block                                                     |
| XPST     | Dependent region PST extension                                               |
| X124     | DL/I pool below the 16MB line for MVS/ESA                                    |

## Fast Path external trace

The Fast Path external trace is a tool for diagnosing problems with Fast Path DL/I calls.

Unexpected DL/I status codes or abends such as U1026 are examples of problems with Fast Path DL/I calls. Fast Path external trace is best suited for diagnosing problems that can be easily recreated, and is not intended to be run routinely because the overhead and output volume of the trace can be large. Fast Path external trace is intended for use primarily by IBM Software Support, but users might also find it useful. IBM Software Support specialists might ask you to capture Fast Path external trace data for analysis by IBM specialists.

Fast Path external trace traces only dependent region activity; you cannot use it to collect data on control region processes. Because most Fast Path DL/I call flow is normally processed in the dependent region, this limitation is not serious. However, if you specify the PARDLI=1 option, DL/I processing is performed under the CTL TCB, which limits the usefulness of Fast Path external trace.

**Recommendation:** Do not trace PARDLI=1 execution. Create the problem again, if possible, without specifying the PARDLI=1 option.

The Fast Path trace entries are documented in [“Fast Path trace entries”](#) on page 687.

## Trace activation

You can activate trace using the Fast Path Transaction Retry, the CCTL DRA thread, or using the `/TRA SET ON TABLE FAST` command.

- The Fast Path Transaction Retry function normally attempts to activate Fast Path external trace when a transaction is retried in an MPP or IFP region after an abend in Fast Path code. In this case, the trace is activated internally for the dependent region that is executing the retry and not for other dependent regions. The trace is deactivated after one retry attempt. The Fast Path Transaction Retry function dynamically allocates an FPTRACE DD statement as a JES SPOOL file and closes and deallocates an FPTRACE DD statement when the trace is deactivated at the end of the retry operation. The intent of the Fast Path Transaction Retry function is to provide first-failure data capture.
- A CCTL DRA thread can also request that Fast Path external trace be activated for a particular thread during the create thread process.
- The trace can also be activated with a `/TRA SET ON TABLE FAST` command. The Fast Path external trace writes diagnostic data to a FPTRACE DD statement in the dependent region JCL. After the trace is activated, the presence or absence of the FPTRACE DD statement determines whether data is traced for each active dependent region, including CCTL DRA threads. A spool file (`SYSOUT=x`) can be used for a FPTRACE DD statement, or a DASD file can be used. DCB attributes are forced to `LRECL=133, BLKSIZE=133, RECFM=FA` by IMS when the DCB is opened.

### Recommendations:

- Use a spool file (`SYSOUT=x`) rather than a disk file. A certain amount of data related to the trace activation itself is traced (written to FPTRACE) before the determination is made that the trace is active or inactive.
- Do not include an FPTRACE DD statement in your standard dependent region JCL. Add it only as required and then remove it after the trace data is collected.

## Trace deactivation

The trace is deactivated with a `/TRA SET OFF TABLE FAST` command.

## Diagnostic data

Data is formatted as it is written. No offline formatting of the trace data is required.

### Trace point identifiers

The FP trace captures module flows, and at certain points, logic flows within modules. In most cases, there is a trace point at entry to a module and another at exit from the module. There might be additional trace points within the module. Each trace point has a unique 4-character identifier. To indicate nesting within call flows, using this unique 4-character identifier, the identifier is shifted right at each level. Each trace entry is prefixed by the identifier located in columns 1-13. The relative position of the identifier within columns 1-13 indicates nesting level, for example:

```
IRC1.....  
.MCL0.....
```

Because the identifier has 4-characters and 13 positions are available, 9 levels of nesting are possible. Output lines with no identifier in columns 1-13 are continuations of the previous entry. The module entry and exit trace entries differ by only one character. Usually, the module exit identifier is the same as the module entry identifier, except for one character. Normally, the first character of the identifier is shifted up one alphabetically, for example:

```
.MCL0.....  
.NCL0.....
```

### Trace point time stamps

Trace point time stamps are labeled with `TOD=xxxxxxx`. The hexadecimal digits are the middle 4-bytes of an 8-byte STCK time stamp. The high order digit is approximately 1 second.

**Note:** Fields that are labeled TIME and DATE within trace entries refer to the compile date and time of the module involved, and are not related to trace time.

### Trace initialization entries

Entries COT1 to TRAN at the beginning of the trace file refer to FP Trace initialization and can be ignored. These entries are produced if a FPTRACE DD statement is specified, even if the trace is not enabled.

### Key trace point data items

The data that is traced for each trace point varies. However, each field has a label to make it easier to determine the contents of the entry. Some of the common and useful labels include:

#### Ra#b,Rab,

Registers a-b follow.

#### CALL

DL/I call function.

#### TOKN

UOR recovery token.

#### MODU

Module entry point address.

#### EPST

EPST address of the dependent region.

#### SSA

The first 30 bytes of the call SSA. Might contain residual data for short SSAs.

## Fast Path external trace examples

The following examples show the Fast Path external trace.

### Trace entries from COT1 to SIEX are tracing the initialization of FPTRACE

```
COT1.....TOD=B6B46252 WKAR=0A6FCC94 R0#F=00000031 007BF6B0 8AD8D6D8 00004700 8A6FC634 00000001 00CC4B20 7ABC7570
8AD8D6D8 007F6A
.....D8
BLTE.....TOD=B6B46259 R15=8AE1A060 DATE=01/0310.3 0#10=00004700 007AE900 8AD8D6C4 00004700 8A6FC634 0A6FCC94
00CC4B20 7ABC7570 8
.....AD8D6D8 007F6AD8 0A6FC040
BLTX.....R0#F=000000DD 007AE900 000000DC 007AF360 8A6FC634 0000000C 000000DD 007AE91C 00000001 007F6AD8 0A6FC040
007AE91C 8AE1A0
.....60 0A5BE738 000000DE 00000000 EPST=0A6FC040 TFTD=007AE900C4C2C6E3C6E3D6D400000000
TSTD=000000000000000000000000000800000000
.....XTOM=00000000
COT2.....R0#F=00004700 007AE900 007AE900 00004700 8A6FC634 0A6FCC94 00CC4B20 7ABC7570 8AD8D6D8 007F6AD8 0A6FC040
00CC5B78 8ADC00
.....D0 0A5BE6F0 8ADC033E 00000000 EPST=0A6FC040 TFTD=007AE900C4C2C6E3C6E3D6D400000000
TSTD=000000000000000000000000000800000000
.....XTOM=00000000
COT3.....R0#F=00004700 007AE900 007AE900 00004700 8A6FC634 0A6FCC94 00CC4B20 7ABC7570 8AD8D6D8 007F6AD8 0A6FC040
00CC5B78 8ADC00
.....D0 0A5BE6F0 8ADC033E 00000000 EPST=0A6FC040 TFTD=007AE900C4C2C6E3C6E3D6D400000000
TSTD=000000000000000000000000000800000000
.....XTOM=00000000
COTX.....TOD=B6B465B8 WKAR=0A6FCC94 R0#F=00004700 007AE900 007AE900 00004700 8A6FC634 0A6FCC94 00CC4B20 7ABC7570
8AD8D6D8 007F6A
.....D8 0A6FC040 00CC5B78 8ADC00D0 0A5BE6F0 8ADC033E 00000000 MODU=8ADC00D0 DATE=08/01/031 TIME=10.32U
LCHA=UP9HCT011
COTE.....TOD=B6B465B9 WKAR=0A6FCC94 R0#F=00000032 007BF6B0 000063AC 8ADC00D0 8A6FC624 00000001 00CC4B20 7ABC7570
00CC5B78 007F6A
.....D8 0A6FC040 00CC5B78 8ADC00D0 0A5BE6F0 8ADC010C 00000000 MODU=8ADC00D0 DATE=08/01/031 TIME=10.32U
LCHA=UP9HCT011
COTY.....TOD=B6B465BA WKAR=0A6FCC94 R0#F=00000030 007BF6B0 8AD91DD8 8ADC00D0 8A6FC624 00000001 00CC4B20 7ABC7570
00CC5B78 007F6A
.....D8 0A6FC040 00CC5B78 8ADC00D0 0A5BE6F0 8ADC019E 00000000 MODU=8ADC00D0 DATE=08/01/031 TIME=10.32U
LCHA=UP9HCT011
STS9.....TOD=B6B46614 R15=8ADDC410 DATE=01/0310.3 0#10=00000950 007BF6B0 000063AC 8ADDC410 8A6FC624 00000001
00CC4B20 7ABC7570 0
.....0CC5B78 007F6AD8 0A6FC040
STSX.....TOD=B6B4664D R15=00000000 DATE=01/0310.3 0#10=00000002 0A5BE060 007AE900 8ADDC410 8A6FC624 00000001
00CC4B20 7ABC7570 0
.....0CC5B78 007F6AD8 0A6FC040
SIEX.....TOD=B6B4664E R15=00000000 DATE=01/0310.3 0#10=00000950 007BF6B0 000063AC 8ADDC410 8A6FC624 00000001
00CC4B20 7ABC7570 0
.....0CC5B78 007F6AD8 0A6FC040
```

## End of trace initialization

```
FPR3.....TOD=B6B60ECA WKAR=0A6FCC94 R0#F=000121F8 0A69602C C7C8E440 00000000 00000001 0A5BE060 0BC14F5B C4C5D7C1
D9E3D4E3 4D0060
.....18 0A6FC040 00010000 8ADBA272 0001EE48 0001EC80 0E48B350 MODU=8ADBA272 DATE=08/05/03P TIME=PQ6040 LCHA=01
1IAB
```

## DL/I call start in DBFIRC10

```
IRC1.....TOD=B6B60ECC R015=00000000 00000C17 C7C8E440 0A69602C 0BC04F54 0A5BE060 00000000 8A71C580 D9E3D4E3
0A9F1048 0A6FC040 00
.....CC5B78 8ADBA272 0A5BE618 0A6FC9F2 00000001 LCRE=0A9F1048 TOKN=E2E8E2F3404040400000000600000000
EPCB=0A69602C PCBA=0A52F
.....35C PCBD=000121F8 ESCD=00CC5B78 MADR=8AD477B0 EPST=0A6FC040 WKAR=0A6FCC94 SVIO=0BC04F54 SVIL=0000 SVSN=0001
.MCLO.....TOD=B6B60ECE CALL=GHU EPST=0A6FC040 WKAR=0A6FCC94 EPCB=0A69602C CCID=00 LCID=00 PRGP=00000000
LKFP=00000000 PCB=0A52F3
.....5C SSA=DEPARTMT(DEPTKEY = R1210000001 MODU=0AD4AD80 DATE=08/01/031 TIME=10.25E LCHA=E}
i"}}
```

## Call is GHU - first 30 bytes of SSA are traced

```
..SAGE.....TOD=B6B60ED0 R0#9=00000000 00000C17 C7C8E440 0A69602C 0BC04F54 0AD4B67C FFFFFFFE20 FEE02D87 00CC4B20
000000FF R14=8AD4AF9
.....0 R15=0AD728C8 EPCB=0A69602C FLGM=00 DMAC=00000000 ARBA=00000000 UOWO=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0BC04F54 POPT=00 SGLS=00 CLOC=00000000
DMHR=00000000 P
.....RBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=00 PROF=0000 LEVL=00 KEYL=00
FLGA=00 FLGB=00
.....ACCK=0000 KEYO=0000 SDBS=00000000 MLTE=0BC04F54 SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0000
SCNT=00000000 SWC1=00
..... SWC2=00 SWC3=00 LOPR=00 SNAP=00000000 EPST=0A6FC040 SCVL=00 REOP=00 FDLN=00 FDOF=0000 DEDB=00
COMP=00000000 STAT=
.....WCH=00 MODU=0AD728C8 DATE=08/01/031 TIME=10.28E LCHA=E}
i"}}
```

## SSA handler for GET type calls

```
...SAGI.....TOD=B6B60EDB R0#9=00000000 00000C17 C7C8E440 0A69602C 00000000 0A6FC588 FFFFFFFE20 FEE02D87 00CC4B20
000000FF R14=8AD7293
.....6 R15=0AD72030 EPCB=0A69602C FLGM=00 DMAC=00000000 ARBA=00000000 UOWO=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=00000000 POPT=80 SGLS=CE CLOC=040C0000
DMHR=00FC7B38 P
.....RBA=070C2000 CRBA=00000000 NRBA=814171C0 GRBA=00000000 XRBA=00000000 SGCD=9E PROF=0008 LEVL=07 KEYL=0C
FLGA=10 FLGB=00
.....ACCK=80CE KEYO=B594 SDBS=078D2000 MLTE=00000000 SFRX=00 SFSX=00 SFWX=04 SFZX=0C SFMX=00 PREF=8002
SCNT=00000000 SWC1=00
..... SWC2=00 SWC3=04 LOPR=00 SNAP=00000000 EPST=0A6FC040 SCVL=00 REOP=00 FDLN=00 FDOF=0000 DEDB=00
COMP=00000000 STAT=
.....WCH=00 MODU=0AD72030 DATE=08/01/031 TIME=10.28E LCHA=E}
i"}}
```

```
...VSNA.....TOD=B6B60EDF R0#9=00000000 00000C17 C7C8E440 0A69602C 00000000 0A6FC588 8BC14F5B FEE02D87 00CC4B20
000000FF R14=8AD7208
.....6 R15=0AD74478 EPCB=0A69602C FLGM=00 DMAC=00000000 ARBA=00000000 UOWO=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=00000000 POPT=80 SGLS=CE CLOC=040C0000
DMHR=00FC7B38 P
.....RBA=070C2000 CRBA=00000000 NRBA=814171C0 GRBA=00000000 XRBA=00000000 SGCD=9E PROF=0008 LEVL=07 KEYL=0C
FLGA=10 FLGB=00
.....ACCK=80CE KEYO=B594 SDBS=078D2000 MLTE=00000000 SFRX=00 SFSX=00 SFWX=04 SFZX=0C SFMX=00 PREF=8002
SCNT=00000000 SWC1=00
..... SWC2=00 SWC3=04 LOPR=00 SNAP=00000000 EPST=0A6FC040 SCVL=00 REOP=00 FDLN=00 FDOF=0000 DEDB=00
COMP=00000000 STAT=
.....WCH=00 MODU=0AD74478 DATE=08/01/031 TIME=10.28E LCHA=E}
i"}}
```

## Verify segment name

```
...VSNA.....TOD=B6B60EE3 R0#9=00000080 00000C17 C7C8E440 0A69602C 0A6960EC 0A6FC588 8BC14F6E 0A6FC5E4 0A696168
000000FF R14=0000001
.....3 R15=00000000 EPCB=0A69602C FLGM=00 DMAC=00000000 ARBA=00000000 UOWO=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=00000000
DMHR=00000000 P
.....RBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEYO=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000001 SWC1=00
..... SWC2=00 SWC3=00 LOPR=80 SNAP=0A696168 EPST=0A6FC040 SCVL=00 REOP=00 FDLN=00 FDOF=0000 DEDB=00
```



```
SGLS=01 CLOC=
.....00000000 DMHR=00000000 PRBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=01
PROF=0000 LEVL=01
.....KEYL=0B FLGA=88 FLGB=00 ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00
SFMX=00 PREF=00
.....06 SCNT=00000001 SWC1=00 SWC2=02 SWC3=00 LOPR=82 SNMT=0A696168 NAME=DEPARTMTY EPST=0A6FC040 SCVL=01
REOP=80 FDLN=0B FDO
.....SSA9.....TOD=B6B613F3 R0#9=00000004 00000000 C7C8E440 0A69602C 0A6960EC 00000001 00000001 FEE02D87 00CC4B20
00000000 R14=8AD4C7A
.....4 R15=0AD712D0 EPCB=0A69602C FLGM=00 DMAC=00000000 ARBA=00000000 UWOW=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=00000000
DMHR=00000000 P
.....RBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000001 SWC1=00
..... SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD712D0 DATE=08/01/031 TIME=10.28P LCHA=PQ73448 A
```

### Search SSA for data

```
...BACK.....TOD=B6B613F6 R15=00000000 DATE=01/0310.2 0#10=00000004 00000000 C7C8E440 0A69602C 0A6960EC 00000001
00000001 FEE02D87 0
.....0CC4B20 00000000 0A6FC040
.....MDRA.....TOD=B6B613F7 R0#9=00000004 00000000 00000000 0A69602C 0A6960EC 00000001 00000001 FEE02D87 00000001
00000000 R14=8AD7186
.....6 R15=0AD4E428 EPCB=0A69602C FLGM=04 DMAC=00000000 ARBA=00000000 UWOW=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=00000000
DMHR=00000000 P
.....RBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000001 SWC1=00
..... SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD4E428 DATE=08/01/031 TIME=10.26E LCHA=E}
i~}}
```

### Determine the possibility of randomizing

```
....MD03.....TOD=B6B613FB WKAR=0A6FCC94 R0#F=00000004 0A4998C0 0A4998C6 0A69602C 0A6960EC 00000010 00000001 FEE02D87
00000001 0000000
.....01 0A6FC040 00CC5B78 0AD4E428 0A5BE780 8AD71866 00000000 MODU=0AD4E428 DATE=08/01/031 TIME=10.26E LCHA=E}
i~}}
```

### No position

```
....MD49.....TOD=B6B613FC WKAR=0A6FCC94 R0#F=00000004 0A4998C0 0A4998C6 0A69602C 0A6960EC 00000010 00000001 FEE02D87
00000001 0000000
.....01 0A6FC040 00CC5B78 0AD4E428 0A5BE780 8AD71866 0A4998D0 MODU=0AD4E428 DATE=08/01/031 TIME=10.26E LCHA=E}
i~}}
```

### Use randomizer

```
....MDRA.....TOD=B6B613FD R0#9=00000004 0A4998C0 0A4998C6 0A69602C 0A6960EC 00000010 00000001 FEE02D87 00000001
00000001 R14=8AD7186
.....6 R15=0A4998D0 EPCB=0A69602C FLGM=04 DMAC=00000000 ARBA=00000000 UWOW=00000000 CCID=8C CCNT=00000001
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=00000000
DMHR=00000000 P
.....RBA=00000000 CRBA=00000000 NRBA=00000000 GRBA=00000000 XRBA=00000000 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000001 SWC1=00
..... SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD4E428 DATE=08/01/031 TIME=10.26E LCHA=E}
i~}}
....MGAP.....TOD=B6B61416 R0#F=00000004 00000000 0000000A 0A69602C 0A6960EC 00000001 00000001 FEE02D87 0AD091C0
0A69602C 0A6FC040 00
.....CC5B78 0AD54858 0A5BE780 8AD71906 0AD54858
```

### Get root anchor point

```
....ERAN.....TOD=B6B61417 R0#F=00000006 0AD0923C 0000000C 0A4998D0 0000000C 00000078 0A6FC140 FEE02D87 0AD091C0
0A69602C 0A6FC040 00
```



```
.....CC5B78 0AD54858 0A5BE780 8AD71906 8B6900E8 TOD=B6B61417 R0#9=00000006 0AD0923C 0000000C 0A4998D0 0000000C
00000078 0A6F
.....C140 FEE02D87 0AD091C0 0A69602C R14=8AD71906 R15=8B6900E8 EPCB=0A4998D0 FLGM=00 DMAC=00000000
ARBA=00000000 UOW0=000000
.....00 CCID=00 CCNT=00000000 UBLK=00000000 DEDB=00 MLTE=0000000C LEVL=80 SDBS=00000000 EPST=0A6FC040
SWAR=DEPTKEY =
.....
```

### Entry to randomizer

```
.....XLAN...TOD=B6B61419 WKAR=0A6FCC94 R0#F=00000000 0AD09288 0000000C 0A4998D0 0000000C 00000078 0A6FC140 FEE02D87
0AD091C0 0A6960
.....2C 0A6FC040 00CC5B78 0AD54858 0A5BE780 8AD54982 00000000 MODU=0AD54858 DATE=08/01/03P TIME=PQ7029 LCHA=96
ABC€}
```

### Entry to randomizer

```
.....NGAP...TOD=B6B6141A R0#F=00000000 0AD09288 00000000 00001004 00000004 00000000 0A6FC140 FEE02D87 0AD091C0
0A69602C 0A6FC040 00
.....CC5B78 0AD54858 0A5BE780 D9C1D5C4 00000000
.....MGRF...TOD=B6B6141B WKAR=0A6FCC94 R0#F=00000000 00000000 0000000A 0A69602C 0A6960EC 00000001 00000001 FEE02D87
0AD09288 000000
.....00 0A6FC040 00CC5B78 0AD56F70 0A5BE780 8AD71912 0AD56F70 MODU=0AD56F70 DATE=08/01/031 TIME=10.26€ LCHA=€}
i~}}
```

### Get root

```
.....MBED...TOD=B6B6141C AREA=DEPTARO
.....0AD09288 00000000 RE#F=8AD5730A 8A71C580
```

### Get control (CI RBA X'1000')

```
.....EXXC...TOD=B6B6141D WKAR=0A6FCC94 R0#F=00000000 00000000 0A6FC284 0A69602C 0A6960EC 8AD56FC4 00001000 00001000
0AD09288 000000
.....00 0A6FC040 00CC5B78 0AD5AB48 0A5BE810 8AD486BA 0AD5AB48 MODU=0AD5AB48 DATE=IVELOCK08 TIME=8/05/0 LCHA=03€}
i~
```

### Get EXCL CI lock (CI RBA X'1000')

```
.....NGXC...TOD=B6B6141F R0#9=0000D800 0A5BE060 00000000 09E6A040 00000008 00001000 00001000 0A960CB0 0AD09288
00000000 RE#F=00 00
.....XCRB=0A960CB0 NEXT=00000000 SHDC=00000000 OPST=0A6FC040 UOWN=00001000 FLGS=80 DMHR=00000000
.....MSRB...R0#F=FFFF4040 0AA922C0 0AD09288 0A69602C 8AD48710 0AD3FA20 00001000 0A960CB0 0AD09288 0AA922C0 0A6FC040
00CC5B78 0AD6E8
.....30 0A5BE858 8AD48B1E 0AD6E830 EPST=0A6FC040 WKAR=0A6FCC94 MODU=0AD6E830 DATE=08/05/031 TIME=13.58P
LCHA=PQ71804 0
```

### Synchronous read of CI

```
.....VSOR.TOD=B6B61424 WKAR=0A6FCC94 R0#F=FFFF4040 00000000 0AD09288 0A69602C 0AA922C0 0AD3FA20 00001000 0A960CB0
0AD09288 0AA922
.....C0 0A6FC040 00CC5B78 0AD98E88 0A5BE8A0 8AD6E902 0AD98E88 MODU=0AD98E88 DATE=08/05/031 TIME=14.00K
LCHA=KX20294 0
.....VSOR.TOD=B6B61426 WKAR=0A6FCC94 R0#F=0AB38800 00000000 0AD09288 00000001 00000000 0A95B268 00001000 00000000
0AD09288 0AA922
.....C0 0A6FC040 00CC5B78 0AD98E88 0A5BE8A0 0009A800 00000000 MODU=0AD98E88 DATE=08/05/031 TIME=14.00K
LCHA=KX20294 0
```

### CI in VSO data space

```
.....NSRB...R0#F=FFFF4040 00000000 0AD09288 0A69602C 0AA922C0 0AD3FA20 00001000 0A960CB0 0AD09288 0AA922C0 0A6FC040
00CC5B78 0AD6E8
.....30 0A5BE858 8AD6E902 00000000 EPST=0A6FC040 WKAR=0A6FCC94 MODU=0AD6E830 DATE=08/05/031 TIME=13.58P
LCHA=PQ71804 0
.....NBED...TOD=B6B61428 R0#9=FFFFFFD8 0AA922C0 FFFFFFFD7 0A69602C 8AD48710 0AD3FA20 00001000 0A960CB0 0AD09288
0AA922C0 RE#F=7A 00
.....XCRB=0A960CB0 NEXT=00000000 SHDC=00000000 OPST=0A6FC040 UOWN=00001000 FLGS=80 DMHR=0AA922C0
.....MGR9...TOD=B6B6142C WKAR=0A6FCC94 R0#F=00000004 0000000B 00000000 0A69602C 0A6960EC 8AD5703C 0AB38008 00001000
0AD09288 0AA922
.....C0 0A6FC040 00CC5B78 0AD56F70 0A5BE780 0AB38010 00000000 MODU=0AD56F70 DATE=08/01/031 TIME=10.26€ LCHA=€}
i~}}
```

### Found the root

```

....NGRF....TOD=B6B6142D WKAR=0A6FCC94 R0#F=00000004 00000000 00000000 0A69602C 0A6960EC 8AD5703C 0AB38008 00001000
0AD09288 0AA922
.....CO 0A6FC040 00CC5B78 0AD56F70 0A5BE780 0AB38010 00000000 MODU=0AD56F70 DATE=08/01/031 TIME=10.26E LCHA=E}
i  }
....FOND....TOD=B6B6142E WKAR=0A6FCC94 R0#F=00000004 00000000 00000004 0A69602C 0A6960EC 00000001 00000001 FEE02D87
00000010 000000
.....00 0A6FC040 00CC5B78 0AD712D0 0A5BE738 0000000C 00000000 MODU=0AD712D0 DATE=08/01/031 TIME=10.28P
LCHA=PQ73448 A
....SSA9....TOD=B6B6142F R0#9=00000004 00000000 00000004 0A69602C 0A6960EC 00000001 00000001 FEE02D87 00001004
00000000 R14=0000126
.....8 R15=00000000 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOW0=00000000 CCID=8C CCNT=00000002
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000001 SWC1=20
..... SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=10 MODU=0AD712D0 DATE=08/01/031 TIME=10.28P LCHA=PQ73448 A
.....MCT3....TOD=B6B61432 WKAR=0A6FCC94 R0#F=00000004 00000000 C7C8E440 0A69602C 0A6960EC 00000001 00000010 FEE02D87
00CC4B20 000000
.....00 0A6FC040 00CC5B78 0AD4C498 0A5BE6F0 8AD4C7A4 00000000 MODU=0AD4C498 DATE=08/01/031 TIME=10.26E LCHA=E}
i  }
.....MCTL....R0#F=00000004 00000000 00000000 0A69602C 0A6960EC 00000001 0AB38010 FEE02D87 00000000 00000000 0A6FC040
00CC5B78 0AD4C4
.....98 0A5BE6F0 0A52F35C 00000000 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOW0=00000000 CCID=8C
CCNT=00000003 UBL
.....K=00000000 DEDB=10 LKFP=00000000 PRGP=00000000 CLEV=0A6960EC DBPC=0A52F35C STC= A LEV=01 SFD=DEPARTMT
.....FD=D9F1F2F1F0F0F0F0F0F0F0F0F0F0F1C140404040404040404040404040404040000E2D7C3C20000000001000301 MLTE=0A6960EC POPT=00
SGLS=01 CLOC=
.....0AB38008 DMHR=0AA922C0 PRBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01
PROF=0000 LEVL=01
.....KEYL=0B FLGA=88 FLGB=00 ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00
SFMX=00 PREF=00
.....06 SCNT=00000002 SWC1=20 SWC2=02 SWC3=00 LOPR=82 SNMT=0A696168 NAME=DEPARTMTÿ EPST=0A6FC040 SCVL=01
REOP=80 FDLN=0B FDO
....RC04....TOD=B6B61437 R0#F=00000004 000000C17 C7C8E440 0A69602C 0A6960EC 00000004 FFFFFFFE20 FEE02D87 00CC4B20
0A5BE060 0A6FC040 00
.....CC5B78 0AD6B640 0A5BE6A8 0000000C 00000000

```

### Found the root; moved from current position

```

....TOGH....TOD=B6B61438 R15=00000000 DATE=01/0310.2 0#10=00000000 00000010 C7C8E440 0A69602C 0A6960EC 00000004
FFFFFFE20 FEE02D87 0
.....0CC4B20 0A5BE060 0A6FC040
....NOPA....TOD=B6B61438 WKAR=0A6FCC94 R0#F=00000000 00000000 0A69602C 0A6960EC 00000004 FFFFFFFE20 FEE02D87
00CC4B20 0A5BE0
.....60 0A6FC040 00CC5B78 0AD6B640 0A5BE6A8 0000000C 00000000 MODU=0AD6B640 DATE=08/01/031 TIME=10.27P
LCHA=PQ69789 A
....MRQC....TOD=B6B6143B R0#9=00000000 0AB3800E 0A69602C 0A69602C 0A69602C 00000004 00000000 FEE02D87 00CC4B20
0A5BE060 R14=8AD6C27
.....2 R15=00000000 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOW0=00000000 CCID=8C CCNT=00000003
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=0A6960EC PRGP=0A6960EC CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEY0=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000002 SWC1=60
..... SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=18 MODU=0AD6B640 DATE=08/01/031 TIME=10.27P LCHA=PQ69789 A
....SEG4....TOD=B6B61443 R15=00000000 DATE=01/0310.2 0#10=00000000 00000C17 0A52F35C 0A69602C 0A6960EC 0AD4B67C
FFFFFFE20 FEE02D87 0
.....0CC4B20 0A5BE060 0A6FC040
....NCL0....R0#F=00000000 00000C17 0A52F35C 0A69602C 0A69602C 8BC14F5B FFFFFFFE20 FEE02D87 00CC4B20 0A52F35C 0A6FC040
00CC5B78 0AD4AD
.....80 0A5BE660 00000030 00000000 EPCB=0A69602C CCID=8C LCID=8C PRGP=0A6960EC LKFP=0A6960EC DBPC=0A52F35C
STC= A LEV=01 S
.....FD=DEPARTMT
.....0080000100400010100010B8800000C00080AD0 STAS=

```

### Call ends

```

..OPMV....TOD=B6B61447 R0#F=00000000 00000000 C7C8E440 0A69602C 0BC04F54 0A5BE060 8A6FC491 00000000 00CC4B20
0BC04F54 0A6FC040 00
.....CC5B78 0ADBA930 0A5BE618 0BC04F54 00000000 IOAR=8A6FC491 IOAL=0000
IOAD=808A6FC491000000000A71C58000000000000000 EPST=0
.....A6FC040 MOVF=8A6FC491 GETL=0000

```

## Move data back to application I/O area

```
FPR3.....TOD=B6B6146E WKAR=0A6FCC94 R0#F=000121F8 0A69602C D9C5D7D3 00000000 00000001 0A5BE060 0BC14F5B C4C5D7C1
D9E3D4E3 400060
.....18 0A6FC040 0001D9F1 8ADBA272 0001EE48 0001EC80 0E48B3AA MODU=8ADBA272 DATE=08/05/03P TIME=PQ6040 LCHA=01
1IAB
```

## REPL call starts

```
IRC1.....TOD=B6B61471 R015=00000000 00000C18 D9C5D7D3 0A69602C 0BC04F54 0A5BE060 00000000 8A71C580 D9E3D4E3
0A9F1048 0A6FC040 00
.....CC5B78 8ADBA272 0A5BE618 0A6FC9FC 00000001 LCRE=0A9F1048 TOKN=E2E8E2F3404040400000000600000000
EPCB=0A69602C PCBA=0A52F
.....35C PCBD=000121F8 ESCD=00CC5B78 MADR=8AD477B0 EPST=0A6FC040 WKAR=0A6FCC94 SVIO=0BC04F54 SVIL=D9F1 SVSN=0001
.MCLO.....TOD=B6B61472 CALL=REPL EPST=0A6FC040 WKAR=0A6FCC94 EPCB=0A69602C CCID=8C LCID=8C PRGP=0A6960EC
LKFP=0A6960EC PCB=0A52F3
.....5C SSA=DEPARTMT MODU=0AD4AD80 DATE=08/01/031 TIME=10.25E LCHA=€}
i~}}
```

## SSA traced

```
.SSAX.....SSA=DEPARTMT
```

## First SSA

```
..SSR9.....TOD=B6B61474 R15=0AD72D18 DATE=01/0310.2 0#10=00000000 00000C18 D9C5D7D3 0A69602C 0BC04F54 0AD4B68C
FFFFFE10 FF3C46E1 0
.....0CC4B20 000000EE 0A6FC040
..VSNA.....TOD=B6B61475 R0#9=00000000 00000C18 D9C5D7D3 0A69602C 0A6960EC 0A6FC588 8BC14F5B FF3C46E1 00CC4B20
000000EE R14=8AD72DD
.....A R15=0AD74478 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOWO=00000000 CCID=E0 CCNT=00000003
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=0A6960EC PRGP=0A6960EC CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEYO=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000002 SWC1=60
.....SWC2=02 SWC3=00 LOPR=82 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD74478 DATE=08/01/031 TIME=10.28E LCHA=€}
i~}}
```

```
..VSNA.....TOD=B6B61478 R0#9=00000000 00000C18 D9C5D7D3 0A69602C 0A6960EC 0A6FC588 8BC14F5B 00000000 00CC4B20
000000EE R14=0A69616
.....8 R15=00000000 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOWO=00000000 CCID=E0 CCNT=00000003
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=0A6960EC PRGP=0A6960EC CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEYO=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000002 SWC1=40
.....SWC2=00 SWC3=00 LOPR=00 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD74478 DATE=08/01/031 TIME=10.28E LCHA=€}
i~}}
```

## Validating segment name

```
..SSR9.....TOD=B6B6147D R15=00000000 DATE=01/0310.2 0#10=00000000 00000C18 D9C5D7D3 0A69602C 0A6960EC 0A6FC588
8BC14F5B 00000000 0
.....0CC4B20 000000EE 0A6FC040
..MRPL.....TOD=B6B6147D R0#9=00000000 00000C18 D9C5D7D3 0A69602C 0A6960EC 0AD4B68C 8BC14F5B 00000000 00CC4B20
0A5BE060 R14=8AD4B01
.....2 R15=0AD6AD40 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOWO=00000000 CCID=E0 CCNT=00000003
UBLK=00000000 KUBL
.....=00000000 DEDB=10 LKFP=0A6960EC PRGP=0A6960EC CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEYO=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000002 SWC1=40
.....SWC2=00 SWC3=00 LOPR=80 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD6AD40 DATE=08/01/03P TIME=PQ7304 LCHA=49 A€}
```

## Replace call handler

```
...PI09.....TOD=B6B61482 WKAR=0A6FCC94 R0#F=00000000 0BC04F54 0AB38008 0A69602C 0A6960EC 0AD4B68C 0A6960EC 00000000
00CC4B20 0A5BE0
.....60 0A6FC040 00CC5B78 0AD678C0 0A5BE6F0 8AD6AE8A 0AD678C0 MODU=0AD678C0 DATE=08/01/03
...PI09.....TOD=B6B61483 WKAR=0A6FCC94 R0#F=0A499672 00000000 0AB38008 0A69602C 0A6960EC 00000000 0A499666 00000000
0000025A 0A5BE0
.....60 0A6FC040 00CC5B78 0AD678C0 0A5BE6F0 0A115556 00000000 MODU=0AD678C0 DATE=08/01/03
```

## Process I/O area for replace

```
...MUH1.....TOD=B6B61484 WKAR=0A6FCC94 R0#F=00000260 00000008 0000000B 0A69602C 0A6960EC 0AD4B68C 00000008 00000000
00000260 0AA922
.....C0 0A6FC040 00CC5B78 0AD737A8 0A5BE6F0 8AD6B0A2 0AD737A8 MODU=0AD737A8 DATE=08/01/031 TIME=10.28E LCHA=C}
i~}
...MUHE.....TOD=B6B61485 WKAR=0A6FCC94 R0#F=00000018 00000025 0A1150C9 0000022B 0AB3803D 0000022B 00000008 00000025
0AB38025 0AA922
.....C0 0A6FC040 00CC5B78 0AD73158 0A5BE738 8AD73850 0AD73158 MODU=0AD73158 DATE=08/01/031 TIME=10.28E LCHA=C}
i~}
...NUHE.....TOD=B6B61486 WKAR=0A6FCC94 R0#F=00000018 00000025 0000001C 0000022B 00000000 00000004 0000003C 00000001
0AB38025 0AA922
.....C0 0A6FC040 00CC5B78 0AD73158 0A5BE738 8AD73850 0AD73158 MODU=0AD73158 DATE=08/01/031 TIME=10.28E LCHA=C}
i~}
...MUH1.....TOD=B6B61487 WKAR=0A6FCC94 R0#F=00000018 00000025 0A1152F4 00000000 0AB38268 00000000 00000008 00000025
0AB38025 0AA922
.....C0 0A6FC040 00CC5B78 0AD737A8 0A5BE6F0 8AD73850 00000000 MODU=0AD737A8 DATE=08/01/031 TIME=10.28E LCHA=C}
i~}
i~}
```

## Record changes to buffer

```
..MRPL.....TOD=B6B61488 R0#9=00000260 00000008 0000000B 0A69602C 0A6960EC 0AD4B68C 00000008 00000000 00000260
0AA922C0 R14=8AD6B0A
.....2 R15=00000000 EPCB=0A69602C FLGM=E0 DMAC=0AD09288 ARBA=00001004 UOWO=00000000 CCID=E0 CCNT=00000003
UBLK=00000000 KUBL
=00000000 DEDB=10 LKFP=0A6960EC PRGP=0A6960EC CLEV=0A6960EC MLTE=0A6960EC POPT=00 SGLS=01 CLOC=0AB38008
DMHR=0AA922C0 P
.....RBA=00001004 CRBA=00001008 NRBA=00001268 GRBA=00001268 XRBA=00001004 SGCD=01 PROF=0000 LEVL=01 KEYL=0B
FLGA=88 FLGB=00
.....ACCK=000C KEYO=0008 SDBS=0AD09210 MLTE=0A6960EC SFRX=00 SFSX=00 SFWX=00 SFZX=00 SFMX=00 PREF=0006
SCNT=00000002 SWC1=40
.....SWC2=00 SWC3=00 LOPR=80 SNAP=0A696168 EPST=0A6FC040 SCVL=01 REOP=80 FDLN=0B FDOF=0008 DEDB=80
COMP=0A4998D0 STAT=
.....WCH=00 MODU=0AD6AD40 DATE=08/01/03P TIME=PQ7304 LCHA=49 AE}
.SEG4.....TOD=B6B6148D R15=00000000 DATE=01/0310.2 0#10=00000000 00000C18 0A52F35C 0A69602C 0A6960EC 0AD4B68C
8BC14F5B 00000000 0
.....0CC4B20 0A5BE060 0A6FC040
.NCL0.....R0#F=00000000 00000C18 0A52F35C 0A69602C 0A6960EC 8BC14F5B 8BC14F5B 00000000 00CC4B20 0A52F35C 0A6FC040
00CC5B78 0AD4AD
.....80 0A5BE660 00000030 00000000 EPCB=0A69602C CCID=E0 LCID=8C PRGP=0A6960EC LKFP=0A6960EC DBPC=0A52F35C
STC= A LEV=01 S
.....FD=DEPARTMT
.....0080000100400010100010B8800000C00080AD0 STAS=
```

## REPL call ends

```
OPMV.....TOD=B6B61490 R0#F=00000000 00000000 D9C5D7D3 0A69602C 0BC04F54 0A5BE060 0A6FC491 00000000 00CC4B20
0BC04F54 0A6FC040 00
.....CC5B78 0ADBA930 0A5BE618 0BC04F54 00000000 IOAR=0A6FC491 IOAL=0000
IOAD=800A6FC4910A1155560A71C58000000000000000 EPST=0
.....A6FC040 MOVV=0A6FC491 GETL=0000
SYN1.....TOD=B6B6149B R15=0AD35F68 DATE=05/0314.0 0#10=00CC4B20 0A5BE060 8A390E8E 0AE1EA34 0A5BE060 0A358698
0A9F1048 00000003 0
.....A35879C 0A5BE060 0A6FC040
```

## Begin synchronization point

```
.SLOG.....TOD=B6B6149C R0#F=0A6FC040 00000001 00000000 0AE1EA34 0A5BE060 00000000 0A9F1048 00000003 0A35879C
0A5BE060 0A6FC040 00
.....CC5B78 0AD34168 0A5BE738 8AD3617E 0AD34168 MODU=0AD34168 DATE=08/05/03U TIME=UP9BDN LCHA=N0112
```

## Log 5950 CI updates

```
..SLGE.....TOD=B6B6149F R15=000007B4 DATE=05/0313.5 0#10=00000004 00001530 0A6FC040 00000010 00CC6EF0 00000070
0A6FC7F4 00CC4B20 0
.....A369920 0A5BE060 0A6FC040
..SLGE.....TOD=B6B614A0 R15=00000004 DATE=05/0313.5 0#10=3A53400A 000014C0 0A6FC040 0AB38000 0A6FD044 00000000
00000002 00CC4B20 0
```

```
.....AD09288 0AD091C0 0A6FC040
..SLGE.....TOD=B6B614A1 R15=000007B4 DATE=05/0313.5 0#10=00000000 00001498 0A6FC040 00007E99 0A88F31E 00000088
0A6FC7F4 00CC4B20 0
.....A369920 0A5BE060 0A6FC040
..SLGE.....TOD=B6B614A2 R15=00000000 DATE=05/0313.5 0#10=00000000 00001498 0A6FC040 00007E99 0A88F31E 00000088
0A6FC7F4 00CC4B20 0
.....A369920 00000000 0A6FC040
```

## Logger calls Fast Path logger exit

```
.TLOG.....TOD=B6B614A3 R0#F=001D431E 0A5BE060 00000000 0A6FC27C 00000090 00000000 0A6FC7DC 0A6FC7DC 00000000
00CC4B20 0A6FC040 00
.....CC5B78 0AD34168 0A5BE738 8AD3486C 00000000 MODU=0AD34168 DATE=08/05/03U TIME=UP9BDN LCHA=N0112
TYN1.....TOD=B6B614A4 R15=00000000 DATE=05/0314.0 0#10=0A6FC040 00800001 00000000 0AE1EA34 305BE060 8A71C580
0A9F1048 00000003 0
.....A35879C 0A5BE060 0A6FC040
```

## End phase I

```
.SYN2.....TOD=B6B614A4 R15=0AD36748 DATE=05/0314.0 0#10=00000000 0A5BE060 8A390E8E 00000000 0A5BE060 0A358698
00CC4B20 00000003 0
.....A35879C 0A5BE060 0A6FC040
```

## Start phase II

```
..SLG2.....TOD=B6B614A5 R15=00000000 DATE=05/0314.0 0#10=00800001 00000000 0A5BE060 00000000 00000000 00000000
00CC4B20 00000003 0
.....A35879C 0A5BE060 0A6FC040
...SYP2.....TOD=B6B614A7 R0#F=00000000 00000000 00000000 00000000 0A5BE060 0A358698 00CC4B20 00000003 0A35879C
0A5BE060 0A6FC040 00
.....CC5B78 0AD370D0 0A5BE738 8AD36938 0AD370D0 MODU=0AD370D0 DATE=08/05/03P TIME=PQ6949 LCHA=94 AE}
...SPIX.....TOD=B6B614A8 R15=0AD35920 DATE=01/03
.....AD09288 00000000 0A6FC040
...XPIX.....TOD=B6B614A9 WKAR=0A6FCC94 R0#F=00000001 0A960CB0 00000000 0A6FC264 00000000 00000000 00CC4B20 0A960CB0
00000000 000000
.....00 0A6FC040 00CC5B78 0ADA6668 0A5BE810 8AD35AA2 0ADA6668 MODU=0ADA6668 DATE=08/05/03K TIME=KZC007 LCHA=77
0E}
...NPIX.....TOD=B6B614AE WKAR=0A6FCC94 R0#F=0A6FC040 00000000 8ADA7284 0ADA4C78 09E6A03C 00001000 FFFFE90 00000000
0AD09288 000000
.....00 0A6FC040 00CC5B78 0ADA6668 0A5BE810 8ADA4D58 00000000 MODU=0ADA6668 DATE=08/05/03K TIME=KZC007 LCHA=77
0E}
...NPIX.....TOD=B6B614AF WKAR=0A6FCC94 R0#F=00000001 00000000 00000000 0A6FC264 00000000 00000000 00CC4B20 00000000
00000000 000000
.....00 0A6FC040 00CC5B78 0AD35920 0A5BE7C8 8AD35AA2 0ADA6668 MODU=0AD35920 DATE=08/01/03
```

## Release locks

```
...TYP2.....TOD=B6B614B0 R0#F=00000000 00000000 00000000 00000000 0A5BE060 0A358698 00000000 00000003 0A35879C
0A5BE060 0A6FC040 00
.....CC5B78 0AD370D0 0A5BE738 8AD37168 00000000 MODU=0AD370D0 DATE=08/05/03P TIME=PQ6949 LCHA=94 AE}
...SHDQ.....TOD=B6B614B1 R15=0AD30B50 DATE=/01/03PQ7 0#10=00000000 00000000 00000000 00000000 0A5BE060 0A358698
00CC4B20 00000003 0
.....A35879C 0A5BE060 0A6FC040
...SHDX.....TOD=B6B614B2 R15=00000000 DATE=/01/03PQ7 0#10=00000000 00000000 00000000 0A6966A8 00000000 00000000
00CC4B20 00000003 0
.....A696018 0A5BE060 0A6FC040
...SDEQ.....TOD=B6B614B2 R0#F=00000000 00000000 00000000 00000000 0A5BE060 0A358698 00CC4B20 00000003 0A35879C
0A5BE060 0A6FC040 00
.....CC5B78 0AD2F3B8 0A5BE738 8AD369BC 0AD2F3B8 MODU=0AD2F3B8 DATE=08/01/031 TIME=10.31K LCHA=KZC0077 1
...BENQ.....TOD=B6B614B3 DATE=01/0310.1 FC=08 UDNA=00000000 UDSR=0000 QBLK=00000000000000000000000000000000
PARM=2003225F0002292773
...RENQ.....TOD=B6B614B4 R0#F=0A6FC040 0A6FC040 0A6FC4EC 00000000 0A5BE060 0A358698 00CC4B20 00000003 0A35879C
00000000 0A6FC040 00
.....CC5B78 0AD2DB78 0A5BE780 8AD2F582 00000000 MODU=0AD2DB78 DATE=08/01/031 TIME=10.10K LCHA=KZC0077 0
...TDEQ.....TOD=B6B614B5 R15=00000000 DATE=01/0310.3 0#10=0A6FC040 00000000 00000008 0A6966A8 00000000 00000001
00000000 00000003 0
.....A696018 00000000 0A6FC040
```

## Dequeue other resources

```
..TYN2.....TOD=B6B614B6 R15=8A71C580 DATE=05/0314.0 0#10=00000000 00800001 00000000 00000000 0A5BE060 0A358698  
00CC4B20 00000003 0  
.....A35879C 0A5BE060 0A6FC040
```

## End phase II

```
..SYN2.....TOD=B6B614B7 R15=0AD36748 DATE=05/0314.0 0#10=00000000 8A5BE060 00000000 0AE1EA34 0A5BE060 0A358698  
00CC4B20 00000003 0  
.....A35879C 0A5BE060 0A6FC040  
..TYN2.....TOD=B6B614B8 R15=0AD36748 DATE=05/0314.0 0#10=00000000 8A5BE060 00000000 0AE1EA34 0A5BE060 0A358698  
00CC4B20 00000003 0  
.....A35879C 0A5BE060 0A6FC040
```

## Chapter 14. IMS Connect service aids

The service aids for IMS Connect include the IMS Connect Dump Formatter and trace options.

### Related tasks

“Collecting data about IMS Connect problems” on page 19

If a problem occurs during IMS Connect execution, you need to collect logs, data sets, and dumps to determine the source of the problem.

### IMS Connect Dump Formatter

An IBM Software Support representative might ask you to use the IMS Offline Dump Formatter to diagnose an IMS Connect problem. The IMS Connect Dump Formatter enables you to format various IMS Connect internal control blocks under the ISPF IPCS environment.

### Accessing the IMS Connect Dump Formatter

You access the IMS Connect Dump Formatter from the IMS Offline Dump Formatter ISPF panels.

To access the IMS Connect Dump Formatter:

1. On the IPCS Component Analysis panel, select DFSAAMPR.

The IMS Dump Formatting Primary Menu panel opens.

```
DFSAAMPR ----- IMS DUMP FORMATTING PRIMARY MENU -----
OPTION  ==>>

 0 INIT          - IMS formatting initialization and content summary
 1 BROWSE       - Browse Dump data set (IPCS norm)          *****
 2 HI-LEVEL     - IMS Component level formatting           *USERID - IMSDUMP
 3 LOW-LEVEL    - IMS ITASK level formatting               *DATE   - 00/08/23
 4 ANALYSIS     - IMS dump analysis                       *JULIAN - 00.236
 5 USER        - IMS user formatting routines             *TIME   - 16:06
 6 OTHER COMP  - Other IMS components (BPE, CQS...)        *PREFIX - IMSDUMP
 7 OTHER PROD  - Other IMS-related products               *TERMINAL- 3278
 E EDA         - IMS Enhanced Dump Analysis              *PF KEYS -
 T TUTORIAL    - IMS dump formatting tutorial             *****
 X EXIT        - Exit IMS dump formatting

Enter END or RETURN command to terminate IMS component formatting.

Use PFKeys to scroll up and down if needed.
```

Figure 72. IMS Dump Formatting Primary Menu panel

2. On the IMS Dump Formatting Menu panel, type 6 for Other Components and press **Enter**.
3. On the Other Components panel, type 6 for IMS Connect and press **Enter**.

### Initializing a dump by using the IMS Connect Dump Formatter

Before you can format a dump, you must initialize it. After you initialize a dump, you can use the options on the IMS Connect Dump Formatting Menu to browse the dump data set, perform high-level or low-level IMS Connect formatting, or perform IMS Connect BPE formatting.

To initialize a dump:

1. Open the IMS Connect Dump Formatting Menu panel, as shown in the following figure.

```

----- IMS CONNECT DUMP FORMATTING MENU -----
OPTION ==>

  0 INIT      - Show BPE status and initialize dump
  1 BROWSE   - Browse dump data set (IPCS norm)
  2 HI-LEVEL - IMS Connect component level formatting
  3 LOW-LEVEL- IMS Connect level formatting

  4 EXT TRACE- BPE external trace formatting

  X EXIT     - Exit IMS dump formatting

*****
*USERID - IMSDUMP
*DATE   - 00/08/23
*JULIAN - 00.236
*TIME   - 16:08
*PREFIX - IMSDUMP
*TERMINAL- 3278
*PF KEYS - 24
*****

Enter END or RETURN command to terminate IMS Connect formatting.

```

Figure 73. IMS Connect Dump Formatting Menu panel

2. Type 0 for Show BPE status and initialize dump, and press **Enter**.

The IMS Connect Dump Initialization panel opens, as shown in the following figure, along with the message that the symbol HWSCSCD was not found.

```

----- IMS CONNECT DUMP CONTENT STATUS AND CONTROL -----
COMMAND ==>
SYMBOL HWSCSCD NOT FOUND
Enter the IMS Connect jobname or ASID to cause the IMS
Connect IPCS symbols to be set for this dump. Press
ENTER with blank jobname and ASID fields to list all
IMS Connect address spaces in the dump.

-----
JOBNAME          ASID          A.S. TYPE      DUMPED?
-----
IMS Connect          ???              ???             NO

SDWA Address:          BPE Release:
CSCD Address:          ??? Release:
??? Sys Name:          ??? Product:

```

Figure 74. IMS Connect Dump Initialization panel

3. Specify either the job name or the address space ID (ASID) of the IMS Connect address you want to format and press **Enter**.

After you specify a job name or ASID, the remaining fields are completed in the initialization panel, as shown in the following figure.

```

----- IMS CONNECT DUMP CONTENT STATUS AND CONTROL -----
COMMAND ==>

Enter the IMS Connect jobname or ASID to cause the IMS
Connect IPCS symbols to be set for this dump. Press
ENTER with blank jobname and ASID fields to list all
IMS Connect address spaces in the dump.

-----
JOBNAME          ASID          A.S. TYPE      DUMPED?
-----
IMS Connect      HWS71R        0042           HWS             YES

BP SDWA Address:  00000000          BPE Release:  010600
BPE CSCD Address: 450015A0          HWS Release:  0A0100
HWS Sys Name:     HWS Product:  5635-A01

```

Figure 75. IMS Connect Dump Initialization panel after initialization

4. To obtain a list of all dumped IMS Connect address spaces, leave the job name and ASID fields blank.
5. Press **F3** to return to the IMS Connect Dump Formatting Menu.



## IMS Connect traces

You can trace two types of information about IMS Connect: information about the messages that are processed by IMS Connect and information about the IMS Connect subsystem.

The information about the messages that are processed by IMS Connect is captured by the IMS Connect Recorder Trace facility. Information about the IMS Connect subsystem is captured by the Base Primitive Environment (BPE) tracing services. The information that is captured by both types of traces is stored in BPE trace tables.

**Recommendation:** Use the BPE trace tables to store information that is captured by the IMS Connect Recorder Trace facility. The IMS Connect Recorder Trace facility can store information in either a BPE trace table or in an IMS Connect-managed Recorder Trace data set (HWSRCRDR).

### IMS Connect Recorder Trace facility

When the IMS Connect Recorder Trace facility is active, IMS Connect takes a snapshot of the first 670 bytes of messages at key points during IMS Connect processing. The first 670 bytes of most messages include the message header and the message data. Included in the information that is captured by the IMS Connect Recorder Trace facility are elements such as:

- Time stamps
- The client ID
- The user message exit routine

When the BPE trace level is set to MEDIUM, or when the HWSRCRDR trace data set is used to capture the trace data, IMS Connect takes a snapshot of each input and output message at the following points:

- Immediately before a message is passed to a user message exit routine by IMS Connect
- Immediately after a message is returned to IMS Connect by a user message exit routine

When the BPE trace level is set to HIGH, the trace information includes a complete snapshot of the message. The recorder trace record also includes a message type code that identifies the source or destination type. IMS Connect takes a snapshot of each complete message, including the message prefixes, at the following points:

*Table 131. IMS Connect recorder trace points with BPE trace level HIGH*

| ID | Type of message             | Trace point                                           |
|----|-----------------------------|-------------------------------------------------------|
| TR | ISC, MSC, ODBM, OTMA, or OM | A TCP/IP message was received by IMS Connect.         |
| TS | ISC, MSC, ODBM, OTMA, or OM | A TCP/IP message was sent by IMS Connect.             |
| IR | OTMA                        | An XCF message was received from OTMA by IMS Connect. |
| IS | OTMA                        | An XCF message was sent to OTMA by IMS Connect.       |
| SR | ISC, MSC, ODBM, or OM       | An SCI message was received by IMS Connect.           |
| SS | ISC, MSC, ODBM, or OM       | An SCI message was sent by IMS Connect.               |

**Recommendation:** Setting the trace level to HIGH can cause a significant impact to IMS Connect performance. Do not set the trace level to HIGH except when troubleshooting problems with connectivity.

If you use the BPE External Trace facility for the IMS Connect Recorder Trace, BPE manages the trace data sets. You must perform certain setup tasks, such as defining the GDG base and specifying the EXTTRACE parameter in the BPE configuration member in the IMS.PROCLIB data set. You can then start the IMS Connect Recorder Trace facility by issuing the BPE command **UPDATE TRACETABLE** NAME(RCTR) OWNER(HWS) LEVEL(MEDIUM) EXTERNAL(YES) or by specifying

TRCLEV=(RCTR,MEDIUM,HWS) in the BPECFG member of the IMS.PROCLIB data set and restarting IMS Connect. To view the results of the trace, you can use the BPE Dump Formatter.

If you use a data set that is managed by IMS Connect, it must be a single, fixed-block data set with a fixed logical record length. The data set must be identified by an HWSRCORD DD statement in the IMS Connect startup JCL. When this data set fills, the IMS Connect Recorder Trace facility is disabled. Starting a new trace overwrites any existing trace data in the data set. To change the data set, you must shut down IMS Connect. From an IMS perspective, you can manage this trace data set in the same way as the IMS Monitor Trace (IMSMON) data set.

### IMS Connect subsystem traces

The IMS Connect subsystem traces are captured by using BPE services. Subsystem traces trace events that occur within the IMS Connect address space and write them to BPE-managed trace tables. Specific types of events are captured in specific trace table types by IMS Connect or BPE. For example, TCP/IP activity is captured in the IMS Connect TCPI trace table type and BPE dispatcher events are captured in the BPE DISP trace table type.

BPE traces of the IMS Connect are enabled either by issuing the UPDATE TRACETABLE command or by including a TRCLEV parameter for IMS Connect in the BPECFG configuration member and restarting IMS Connect support.

For more information about configuring BPE and preparing for IMS Connect diagnosis, see *IMS Version 14 System Definition*.

### Enabling and starting all IMS Connect traces at the same time

You can enable tracing for all trace table types, excluding the Recorder Trace facility trace table (RCTR), by specifying an asterisk in the first position of the TRCLEV parameter in the BPECFG file member, for example TRCLEV=(\*,HIGH,HWS). When the TRCLEV parameter is specified in the BPECFG file, the IMS Connect traces run continuously and resume every time IMS Connect starts.

**Recommendation:** Do not run IMS Connect Recorder trace facility continuously. The IMS Connect Recorder Trace facility can affect performance and should be used only when detailed information is needed about a specific problem with IMS Connect message handling. Remember to disable the IMS Connect Recorder Trace after the problem is resolved.

To enable all traces except the Recorder Trace facility, specify the following parameters:

```
TRCLEV=(*,HIGH,HWS)
```

BPE exempts the Recorder trace (RCTR) from wildcard arguments, so it must be enabled with the following trace level configuration statement:

```
TRCLEV=(RCTR,MEDIUM,HWS)
```

**Recommendation:** Start the IMS Connect Recorder Trace with the command, rather than with the TRCLEV parameter. Only use the TRCLEV parameter when you are diagnosing problems that prevent you from issuing commands.

BPE traces can be started and stopped by using BPE commands. If you start a trace by using the UPDATE TRACETABLE command, the traces are only active for the current execution of IMS Connect. The trace tables that are used by BPE to store the trace information, such as the RCTR trace table, are also managed by using BPE commands.

### Related tasks

[“Formatting a BPE trace entry” on page 11](#)

You can format a BPE trace entry by using either the Interactive Problem Control System (IPCS) or a batch job.

## Configuring BPE for an external trace of IMS Connect

Before you can start a BPE external trace for IMS Connect, you must first configure BPE and the external trace data set.

The following steps configure the external trace data sets and BPE for an external BPE trace of IMS Connect.

1. Define the generation data group (GDG) base.

```
//STEP1 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
  DEFINE GENERATIONDATAGROUP -
    (NAME(IMSTESTL.RCTR.GDG01) -
     NOEMPTY -
     SCRATCH -
     LIMIT(255))
//
```

2. In the BPECFGxx member of the IMS.PROCLIB data set, specify the following parameters for IMS Connect:

- EXTTRACE
- TRCLEV

In the EXTTRACE statement, specify the data set name of the generation data set group that you created in Step 1 and specify HWS in the COMP() parameter to identify IMS Connect as the BPE component to which this EXTTRACE statement applies.

```
EXTTRACE(GDGDEF( DSN(IMSTESTL.RCTR.GDG01)
                 UNIT(SYSDA) VOLSER(000000)
                 SPACE(1) SPACEUNIT(CYL)
                 BLKSIZE(32760) ) COMP(HWS) )
```

When the Recorder Trace (TRCLEV type parameter RCTR) trace level is set to MEDIUM, message data is recorded before a message is sent to a user message exit and after the exit returns a message.

You can set the trace level to HIGH to enable additional trace points. When these trace points are enabled, a trace record is also written when IMS Connect sends a message to or receives a message from a TCP/IP endpoint, a DRDA client, an SCI client, or OTMA via XCF. These records are not collected when the trace level is set to any value other than HIGH or when IMS Connect uses internal tracing.

**Recommendation:** Use the BPE External Trace with the TRCLEV parameter HIGH only when troubleshooting IMS Connect client or OTMA-related problems. A large amount of trace data is recorded when the trace level is set to HIGH.

In the TRCLEV parameter, you must specify EXTERNAL=YES to enable the External Trace facility:

```
TRCLEV=(RCTR,MEDIUM,HWS,EXTERNAL=YES)
```

**Tip:** If TRCLEV=(RCTR,MEDIUM,HWS,EXTERNAL=YES) is specified in the BPECFG member, the Recorder trace resumes every time IMS Connect restarts. If you do not want the Recorder trace to resume when IMS Connect restarts, issue the BPE command F hwsjobname,UPD TRTAB NAME(RCTR) LEVEL(MEDIUM) EXTERNAL(YES)

If BPE is correctly configured for an external IMS Connect Recorder trace, BPE issues message BPE0044I BPE EXTERNAL TRACE FUNCTION NOT ACTIVE. You can now start the trace.

### Related tasks

[Tracing BPE components \(System Administration\)](#)

[Setting up tracing for BPE-managed address spaces \(System Definition\)](#)

## Related reference

[BPE configuration parameter member of the IMS PROCLIB data set \(System Definition\)](#)

## Starting an external trace for IMS Connect

You can start an external trace of IMS Connect by modifying the IMS Connect startup procedure or by issuing the BPE **UPDATE TRACETABLE** command.

Before you can start a BPE external trace for IMS Connect, you must first define a generation data group (GDG) base and code an EXTTRACE statement for IMS Connect in the BPECFGxx member of the IMS.PROCLIB data set.

Start the IMS Connect Recorder Trace by using one of the following methods.

- Include BPECFG=BPECFGxx in the IMS Connect startup procedure, where BPECFGxx is the BPE PROCLIB member that contains the EXTTRACE statement for IMS Connect, and restart IMS Connect. The BPE external trace starts when IMS Connect is started and BPE issues the following message:

```
BPE0046I EXTERNAL TRACE DATA SET
IMSTESTL.RCTR.GDG01.G0001V00 OPENED ON VOL=000000
```

- While IMS Connect is running, issue the BPE command **UPDATE TRACETABLE**. For example:  
F HWS1,UPDATE TRACETABLE NAME(RCTR) OWNER(HWS) LEVEL(MEDIUM) EXTERNAL(YES).

When the command completes successfully, the following messages are issued:

```
BPE0032I UPDATE TRACETABLE COMMAND COMPLETED
BPE0046I EXTERNAL TRACE DATA SET
IMSTESTL.RCTR.GDG01.G0003V00 OPENED ON VOL=000000
```

**Note:** If EXTERNAL(NO) is specified on either the UPDATE TRACETABLE command or in the TRCLEV parameter in the BPECFGxx PROCLIB member, IMS Connect writes the Recorder Trace data to the in-core trace tables. IMS Connect writes to the in-core trace tables by default.

**Recommendation:** Use the BPE Trace facility. If the BPE Trace facility is in use, setting the trace level to HIGH captures records when messages are passed to and from TCP/IP clients and OTMA in addition to the normal trace records. If the HWSRCRDR trace data set is used, these additional trace records are not captured.

## Related tasks

[Starting and stopping BPE external tracing \(System Administration\)](#)

## Related reference

[BPE configuration parameter member of the IMS PROCLIB data set \(System Definition\)](#)

## Stopping an external BPE trace of IMS Connect

Stop an external BPE trace of IMS Connect by issuing the BPE command **UPDATE TRACETABLE**.

For example, F HWS1,UPDATE TRACETABLE NAME(RCTR) OWNER(HWS) LEVEL(NONE) EXTERNAL(NO).

**Note:** To deallocate the GDG data set, you must specify EXTERNAL(NO) on the **UPDATE TRACETABLE** command.

After the successful execution of the UPDATE TRACETABLE command, BPE issues the following messages.

```
BPE0032I UPDATE TRACETABLE COMMAND COMPLETED
BPE0046I EXTERNAL TRACE DATA SET
IMSTESTL.RCTR.GDG01.G0001V00 CLOSED ON VOL=000000
BPE0044I BPE EXTERNAL TRACE FUNCTION NOT ACTIVE
```

## Related tasks

[Starting and stopping BPE external tracing \(System Administration\)](#)

## Displaying the status of an external trace of IMS Connect

Display the status of an external BPE trace of IMS Connect by issuing the BPE command **DISPLAY TRACETABLE**.

For example, F HWS1, DISPLAY TRACETABLE NAME(RCTR).

If the BPE external trace of IMS Connect is active, BPE displays the following messages:

```
BPE0030I TABLE OWNER LEVEL #PAGES EXT #ENTRIES #CYCLES
BPE0000I RCTR HWS MEDIUM 300 YES 4 0
BPE0032I DISPLAY TRACETABLE COMMAND COMPLETED
```

If the BPE external trace of IMS Connect is inactive, BPE displays the following messages:

```
BPE0030I TABLE OWNER LEVEL #PAGES EXT #ENTRIES #CYCLES
BPE0000I RCTR HWS NONE 300 NO 0 0
BPE0032I DISPLAY TRACETABLE COMMAND COMPLETED
```

## Formatting the trace data from an external trace of IMS Connect

The following example shows the JCL that can be used to format the trace data from an external trace of IMS Connect.

```
//STEP01 EXEC PGM=IKJEFT01,REGION=0M,COND=(0,LT)
//STEPLIB DD DISP=SHR,DSN=IMSB LD.I11RTS19.CRESLIB
//SYSTSPRT DD SYSOUT=*
//IPCSPRNT DD SYSOUT=*
//IPCSPARM DD DISP=SHR,DSN=SYS1.PARMLIB
//SYSTSIN DD *
ALLOC F(IPCSDDIR) DA('IMSTESTL.DDIR') SHR REUSE
ALLOC F(INFILE) DA('IMSTESTL.RCTR.GDG01.G0001V00') SHR REUSE
IPCS NOPARM
SETDEF DSN('IMSTESTL.RCTR.GDG01.G0001V00')
SETDEF NOPROBLEM PRINT NOTERMINAL
VERBX BPETRFM0 'TRACE(TYPE(ALL))'
END
//
```

### Related tasks

[“Formatting a BPE trace entry” on page 11](#)

You can format a BPE trace entry by using either the Interactive Problem Control System (IPCS) or a batch job.

## Tracing to the HWSRCRDR data set

If you are not using BPE to manage the output of the IMS Connect Recorder Trace facility, you can enable and start a recorder trace that is managed by IMS Connect.

To trace to the HWSRCRDR data set:

1. Allocate an HWSRCRDR data set.
2. Include an HWSRCORD DD statement in the IMS Connect startup JCL.
3. Issue one of the following commands:
  - IMS Connect WTOR command **RECORDER OPEN**
  - IMS Connect z/OS command **UPDATE MEMBER TYPE(IMSCON) START(TRACE)**
  - IMS Connect type-2 command **UPDATE IMSCON TYPE(CONFIG) START(RECORDER)**

### Related reference

[RECORDER command \(Commands\)](#)

## Recorder log record mappings

IMS Connect trace recorder logs are mapped with the HWSUSTAT DSECT or the HWSLRCTR DSECT.

If the IMS Connect trace facility is activated with the HWSRCRDR internal data set, standard record log records are written that are mapped with the HWSUSTAT DSECT.

If the IMS Connect trace facility is activated with an external, BPE-managed data set and the trace level is set to HIGH, extended log records are also written in addition to the standard log records. These additional records contain more information, including a complete snapshot of the message, and are mapped with the HWSLRCTR DSECT.

Both DSECTS are in the HWSUSTAT macro in the IMS.SDFSMAC data set.

### Standard recorder log record mapping

When the IMS Connect line trace facility is activated by the IMS Connect WTOR command *nn***RECORDER OPEN**, the IMS Connect type-2 command **UPDATE IMSCON TYPE(CONFIG) START(RECORDER)**, or the z/OS modify command **UPDATE MEMBER TYPE(IMSCON) START(TRACE)**, IMS Connect writes the log records to the HWSRCDR data set. If the trace facility is activated with a BPE data set, these records are written to the specified BPE data set instead.

The following examples provide mapping information to help you navigate and interpret the contents of the HWSRCDR data set, or an external BPE data set that contains the HWSUSTAT log records. The DSECT for this mapping is located in the HWSUSTAT macro of the IMS.SDFSMAC data set. The DSECT name is HWSUSTAT. When the trace level for an external data set is set to HIGH, the data set contains both standard log records (mapped by the HWSUSTAT DSECT) and extended log records (mapped by the HWSLRCTR DSECT).

### This topic contains Diagnosis, Modification, and Tuning information.

```

*****
*                COMMON SECTION          32_BYTES
*****
USTAT_NEXT      DS  F          NEXT POINTER
USTAT_EYE       DS  CL4'ICON'        EYECATCHER
USTAT_CALLID    DS  CL2          CALLER ID
*
*                CHARS "AE" - ADAPTER MSG ERROR
*                CHARS "AR" - ADAPTER MSG RECEIVE
*                CHARS "AX" - ADAPTER MSG SEND
*                CHARS "ER" - IMS TM MSG READ ERROR
*                CHARS "ME" = MSC ERROR
*                CHARS "MR" = MSC RECEIVE
*                CHARS "MS" = MSC SEND
*                CHARS "OE" - IMS DB MSG READ ERROR
*                CHARS "OR" - IMS DB MSG RECEIVE
*                CHARS "OX" - IMS DB MSG SEND
*                CHARS "RC" - IMS TM MSG RECEIVE
*                CHARS "RE" = OTMA REMOTE ALTPCB
*                ERROR
*                CHARS "RR" = OTMA REMOTE ALTPCB
*                RECEIVE
*                CHARS "RS" = OTMA ALTPCB IMS to IMS
*                SEND
*                CHARS "SN" - IMS TM MSG SEND
*                CHARS "TO" = TIMEOUT EVENT
*
USTAT_SMFHDR    DS  0C          SMF HEADER
SMFITOCLEN      DS  CL2          SMF LENGTH
SMFITOCSEG      DS  CL2          INTERNAL WORK
SMFITOCFLG      DS  X           INTERNAL FLAG
SMFITOCRTY      DS  X           RECORD TYPE
SMFITOCTME      DS  CL4          TIME OF TRACE
SMFITOCDTE      DS  CL4          SEQUENCE NUMBER
SMFITOCSID      DS  CL4          RESERVED
SMFITOCSID      DS  CL4          RESERVED
*****
*                UOW PROGRESSION TIME STAMP SECTION
*****
SMFITOCCID      DS  CL8          CLIENT NAME
USTAT_TSMREC    DS  D           TIME HWSW MSG RECEIVED
USTAT_TSMNQ     DS  D           TIME HWSW MSG ENQUEUED
USTAT_TDMDQ     DS  D           TIME 1ST DST MSG DEQUEUED
USTAT_TCLRDQ   DS  D           TIME DST CLR DENQUEUED
USTAT_TERROR    DS  D           TIME ERROR OCCURRED
USTAT_NMSGX     DS  H           NUMBER OF MSGS TRANSMITTED
USTAT_NMSGR     DS  H           NUMBER OF MSGS RECEIVED
USTAT_NMSGR     DS  CL8          RESERVED
USTAT_SMFITOCL EQU *-USTAT_SMFHDR LENGTH OF SMF
*****
*                INPUT MSG

```

```

*****
USTAT_IN_EYE DS CL4 '*IPB' EYECATCHER
*
* *IPB IS THE INPUT TO THE EXIT
* FOR EITHER RECEIVE OR SEND
* USTAT_CALLID = AE - ADAPTER ERROR
* AR - ADAPTER RECEIVE
* AX - ADAPTER SEND
* ER - TM READ ERROR
* ME - MSC ERROR
* MR - MSC RECIEVE
* MS - MSC SEND
* OE - DB ERROR
* OR - DB RECIEVE
* OX - DB SEND
* RC - TM RECEIVE
* RE - OTMA REMOTE
* ALTPCB ERROR
* RR - OTMA REMOTE
* ALTPCB RECIEVE
* RS - OTMA REMOTE
* ALTPCB SEND
* SN - TM SEND
*
* for ICONRC and *IPB
* (USTAT_CALLID = "RC")
*
* THE LOGGED DATA STARTING AT OFFSET X'60' IS AS FOLLOWS:
* (INPUT TO EXIT FROM CLIENT)
* 1111
* IRM
* 11zzTRANCODEDATA
* X'00040000'
*****
* for ICONSN and *IPB
* (USTAT_CALLID = "SN")
*
* THE LOGGED DATA STARTING AT OFFSET X'60' IS AS FOLLOWS:
* (INPUT TO EXIT FROM IMS APPLICATION)
* OTMA CONTROL HEADER followed by
* OTMA STATE DATA HEADER (if present) followed by
* OTMA SECURITY DATA HEADER (if present) followed by
* OTMA USER DATA HEADER (if present) followed by
* DATA TO BE SENT
* 11zzTRANCODEDATA
*
USTAT_MSG_I DS CL202 MSG
*****
* for ICONAR and *IPB
* (USTAT_CALLID = "AR")
*
* THE LOGGED DATA STARTING AT OFFSET X'60' IS AS FOLLOWS:
* (INPUT TO EXIT FROM CLIENT)
* 1111
* IRM
* XML
*
*****
* for ICONAX and *IPB
* (USTAT_CALLID = "AX")
*
* THE LOGGED DATA STARTING AT OFFSET X'60' IS AS FOLLOWS:
* (INPUT TO EXIT FROM OUTPUT FROM EXIT OF APPLICATION OUTPUT DATA)
* 1111
* 11zzDATA
* CSM
*
USTAT_MSG_I DS CL202 MSG
*****
* OUTPUT MSG
*****
USTAT_OUT_EYE DS CL4 '*OPB' EYECATCHER
*
* *OPB IS THE OUTPUT FROM THE EXIT
* FOR EITHER RECEIVE OR SEND
* USTAT_CALLID = AE - ADAPTER ERROR
* AR - ADAPTER RECEIVE
* AX - ADAPTER SEND
* ER - TM READ ERROR

```

```

*
* ME - MSC ERROR
* MR - MSC RECIEVE
* MS - MSC SEND
* OE - DB ERROR
* OR - DB RECIEVE
* OX - DB SEND
* RC - TM RECEIVE
* RE - OTMA REMOTE
* ALTPCB ERROR
* RR - OTMA REMOTE
* ALTPCB RECIEVE
* RS - OTMA REMOTE
* ALTPCB SEND
* SN - TM SEND
*
* for ICONRC and *OPB
* (USTAT_CALLID = "RC")
*
* THE LOGGED DATA STARTING AT OFFSET X'300' IS AS FOLLOWS:
* (OUTPUT FROM USER EXIT OF CLIENT INPUT DATA)
* OTMA CONTROL HEADER followed by
* OTMA STATE DATA HEADER (if present) followed by
* OTMA SECURITY DATA HEADER (if present) followed by
* OTMA USER DATA HEADER (if present) followed by
* APPLICATION DATA TO BE SENT
* 11zzTRANCODEDATA
*****
* FOR ICONSN AND *OPB
* (USTAT_CALLID = "SN")
*
* THE LOGGED DATA STARTING AT OFFSET X'300' IS AS FOLLOWS:
* (OUTPUT FROM USER EXIT OF APPLICATION OUTPUT DATA)
* OTMA CONTROL HEADER followed by
* OTMA STATE DATA HEADER (if present) followed by
* OTMA SECURITY DATA HEADER (if present) followed by
* OTMA USER DATA HEADER (if present) followed by
* DATA TO BE SENT (ONE OF THE FOLLOWING STRUCTURES
* 'RMM'LLZZDATA.....'CSM'
* LLZZDATA.....'CSM'
* 'RSM'
*
* RMM is the *REQMOD* structure
* CSM is the *CSMOKY* structure
* RSM is the *REQSTS* structure
*
*****
* FOR ICONAR AND *OPB
* (USTAT_CALLID = "AR")
*
* THE LOGGED DATA STARTING AT OFFSET X'300' IS AS FOLLOWS:
* (OUTPUT FROM USER EXIT OF CLIENT INPUT DATA)
* 1111
* IRM
* 11zzTRANCODEDATA
* X'00040000'
*
*****
* FOR ICONAX AND *OPB
* (USTAT_CALLID = "AX")
*
* THE LOGGED DATA STARTING AT OFFSET X'300' IS AS FOLLOWS:
* (OUTPUT FROM USER EXIT OF APPLICATION OUTPUT DATA)
* 1111
* XML
* CSM
*
USTAT_END_EYE DS CL4'*END' EYECATCHER

```

### Extended recorder log record mapping

This mapping shows the contents of an IMS Connect recorder trace log when the IMS Connect recorder trace is activated with an external, BPE-managed data set and trace level HIGH.

When the trace level for an external data set is set to HIGH, the data set contains both standard log records (mapped by the HWSUSTAT DSECT) and extended log records (mapped by the HWSLRCTR DSECT).



You can also see this DSECT in the HWSUSTAT macro of the IMS.SDFSMAC data set. The DSECT name is HWSLRCTR.

```

*****
* * *          HEADER FOR LARGE RECORDER TRACE RECORDS          * * *
*****
LRCTR_LL      DS  F          LENGTH OF BUFFER
LRCTR_EYE     DS  CL4'ICON'  EYECATCHER
LRCTR_CALLID  DS  CL2          CALLER ID
*
*              CHARS "IR" - XCF RECEIVE
*              CHARS "IS" - XCF SEND
*              CHARS "SR" - SCI RECEIVE
*              CHARS "SS" - SCI SEND
*              CHARS "TR" - TCP/IP RECEIVE
*              CHARS "TS" - TCP/IP SEND
*
*              DS  H          RESERVED 4 FUTURE CALLER ID
LRCTR_MSG_TYPE DS  CL4          MESSAGE TYPE
*              CHARS "ISC " - ISC MESSAGE
*              CHARS "MSC " - MSC MESSAGE
*              CHARS "ODBM" - ODBM MESSAGE
*              CHARS "OM  " - OM MESSAGE
*              CHARS "OTMA" - OTMA MESSAGE
*
*              DS  CL4          RESERVED (MSG TYPE)
*              DS  F          RESERVED
LRCTR_SOURCE  DS  CL8          MESSAGE SOURCE
*              ORG LRCTR_SOURCE OR
LRCTR_PORTID  DS  CL8          MESSAGE PORT
LRCTR_CLIENT  DS  CL8          CLIENT NAME
*              ORG LRCTR_CLIENT OR
LRCTR_TPIPE   DS  CL8          TPIPE NAME
LRCTR_TIMSTMP DS  D           RECORD'S TIME STAMP
LRCTR_LTOKEN  DS  CL8          ICON Socket Logon token
*              DS  F          RESERVED
LRCTR_IO_EYE  DS  CL4          '*IPB' OR '*OPB' INPUT OR OUTPUT
LRCTR_IO_IPB  EQU  C'*IPB'    INBOUND MESSAGE:
*
*              *IPB DENOTES THE BEGINNING OF A
*              MESSAGE RECEIVED BY IMS CONNECT.
LRCTR_IO_OPB  EQU  C'*OPB'    OUTBOUND MESSAGE:
*
*              *OPB DENOTES THE BEGINNING OF A
*              MESSAGE SENT BY IMS CONNECT.
*

```



---

# Chapter 15. IRLM - Internal resource lock manager service aids

Several service aids can help you analyze internal resource lock manager (IRLM) problems. Additionally, IRLM generates diagnostic messages that begin with the prefix DXR.

---

## IRLM dumps

IRLM uses the SDUMP system services of z/OS when failures occur.

IRLM uses the SDUMP system services of z/OS in the following situations:

- Within the IRLM address space
- While executing IRLM code or IMS code within the IMS address space
- While executing IRLM code for exits from SLM within the IMS address space

SDUMP dumps the IRLM address space to a SYS1.DUMPxx data set without formatting it. When dump processing completes, you can format the dump offline by specifying IRLM on the VERBEXIT subcommand in IPCS. If more than one IRLM is active in the system at the time the dump was taken, you must also specify the z/OS subsystem name (IRLMNM in the IRLM procedure). IRLM dump formatters that are shipped with a particular release of IRLM are specific to that release. If multiple IRLM releases are active, IPCS must be configured to have access to the appropriate IRLM PDS. The release of the IRLM in the dump must match the release of the IRLM in the IPCS STEPLIB.

To access z/OS component trace entries for IRLM, use the IPCS `CTRACE` or `VERBX` command. To see the syntax of the `VERBX` command for displaying traces, enter: `IPCS VERBX IRLM 'help'`.

### Examples:

- If only one IRLM is in the dump, this command formats the IRLM address space:

```
VERBX IRLM 'SUBsys=IRLM'  
OI  
VERBX IRLM  
OI  
VERBX IRLM 'SUB=IRLM'
```

- If more than one IRLM is in the dump, this command formats the KRLM address space:

```
VERBX IRLM 'SUBsys=KRLM'  
OI  
VERBX IRLM 'SUB=KRLM'
```

If you want to format dumps online during the abnormal termination process, you must change the FMTO parameter to request a SNAP dump.

**Tip:** Under the direction of IBM Software Support, you can use the Modify DIAG command to take diagnostic dumps.

---

## SYS1.LOGREC records

The internal resource lock manager (IRLM) generates a software LOGREC record when the IRLM detects a program error.

You can use the z/OS IFCEREP1 service aid to obtain a listing of the SYS1.LOGREC data set that contains the LOGREC entries for the IRLM.

## z/OS component trace

Use the z/OS **TRACE CT** command to start, stop, or modify an internal resource lock manager (IRLM) diagnostic trace.

IRLM does not support all the options that are available on the TRACE command.

You can use the **TRACE CT** command to trace interactions with a DBMS, member and group events, z/OS locking components, and so on.

The following example shows trace output for a lock request using the DBM and SLM sublevel traces.

The z/OS Interactive Problem Control System (IPCS) subcommand that produced this output is: **CTRACE COMP(IRLE) SUB((DBM)) FULL**

### COMPONENT TRACE FULL FORMAT COMP (IRLE) SUBNAME ((DBM))

```
COMPONENT TRACE FULL FORMAT
COMP(IRLE) SUBNAME((DBM))
**** 02/10/09
MNEMONIC ENTRY ID TIME STAMP DESCRIPTION
-----
DBM 00000002 18:42:05.816178 RLPL format
+0000 ID..... DXRRL100-01: START A REQUEST
+0020 TLA1..... 000100C8 07166220
+0028 RLPL..... 00000000 06545768 00000000 80000000 00000000
+003C 00000000 006B12C8 008FBBC0 0090B000 00906048
+0050 00316545 06545060 00000000 00316545 06545060
+0064 00000000 00000000 00000000 0423AD20 09000058
+0078 C8806D01 D7000000 00000000 00000000 00000000
+008C 00000000 00000000 80000000 00000000 00000000
+00A0 006B12C8 008FBBC0 02060000 8A000000 00000000
+00B4 00000000 006B5BE4 00000000 00000000 00000000
+00C8 00000000 00000000 00000000 00000000 00000000
+00DC 00000000 00000000 00000000 00000000 00000000
DBM 00000002 18:42:05.816406 RLPL format
+0000 ID..... DXRRL100-02: REQUEST COMPLETED
+0020 TLA1..... 000100C8 07166220
+0028 RLPL..... 00000000 06545768 00000000 80000000 00000000
+003C 00000000 006B12C8 008FBBC0 0090B000 00906048
+0050 00316545 06545060 00000000 00316545 06545060
+0064 00000000 00000000 00000000 0423AD20 09000058
+0078 C8806D01 D7000000 00000000 00000000 00000000
+008C 00000000 00000000 80000000 00000003 00000000
+00A0 006B12C8 008FBBC0 02060000 8A000000 00000000
+00B4 00000000 006B5BE4 00000000 00000000 00000000
+00C8 00000000 00000000 00000000 0067027C A743B4E5
+00DC 09010080 00000000 00080000 00000000 00000000
```

The z/OS IPCS subcommand that produced this output is: **CTRACE COMP(IRLE) SUB((SLM)) FULL**

### COMPONENT TRACE FULL FORMAT COMP (IRLE) SUBNAME ((SLM))

```
COMPONENT TRACE FULL FORMAT
COMP(IRLE) SUBNAME((SLM))
**** 02/10/09
MNEMONIC ENTRY ID TIME STAMP DESCRIPTION
-----
SLM 00000010 18:42:05.816193 RNA, RTE and UDB format
+0000 ID..... DXRRL120-01: IXLLOCK OBTAIN
+0020 TLA1..... 00060020 00670238
+0028 RNA..... 09000058 C8806D01 D7000000 00000000 00000000
+003C 00000000 00000000 00000000
+0048 TLA2..... 000C0040 07166418
+0050 RTE..... 0423AD20 09000058 C8806D01 D7000000 00000000
+0064 00000000 00000000 00000000 00000000 00000008
+0078 C9D4E2C5 40404040 0423AD20 00000000 00000000
+008C 00000000
+0090 TLA3..... 000B0040 071663D8
+0098 UDB..... C9D4E2C5 40404040 00000000 00000000 00080000
+00AC 00000000 00000000 00000000 00000000 40000000
+00C0 08000000 00000000 A8D1A743 B4D7B281 A8D1A743
+00D4 B4D7B281
SLM 00000020 18:42:05.816397 RNA and reason code
+0000 ID..... DXRRL120-03: IXLLOCK RETURN
+0020 TLA1..... 00060020 00670238
+0028 RNA..... 09000058 C8806D01 D7000000 00000000 00000000
```

```
+003C      00000000 00000000 00000000
+0048  TLA2..... 00060004 0716637C
+0050  REAS..... 00000000
```

**Related reference**

[z/OS: MVS interactive problem control system \(IPCS\) CTRACE subcommand](#)  
[TRACE CT command \(Commands\)](#)



---

## Chapter 16. MSC - Multiple Systems Coupling service aids

Various types of traces are available to help you diagnose Multiple Systems Coupling (MSC) problem in a non-Database Control (DBCTL) environment.

---

### Multiple Systems Coupling communication task trace

---

The flow through an MSC communication task is similar to that through the terminal communication task. The register 0 trace is read in the same manner, and most of the MSC analyzer and MSC DDM entry points provide the same functions as the terminal communications analyzer and DDMs.

The entry points for the MSC analyzer and device-dependent modules (DDMs) are:

**DDM entry point**  
**Analyzer**

**AM01**

Process input from a link

**AM02**

Perform read or read of the link

**AM03**

Determine what to do next on the link

**AM04**

Not used

**AM05**

Perform write or send to the link

**AM06**

Dequeue the message after a good write or send

**AM07**

Not used

**AM08**

Return a message to the message queues for later transmission

**AM09**

Generate an error message

**AM10**

Quiesce the link

**AM11**

Not used

**AM12**

Wait for the completion of asynchronous I/O or the enqueue of a message

---

### Multiple Systems Coupling device-dependent module

---

A Multiple Systems Coupling (MSC) device-dependent module performs all of the functions unique to a type of link.

The functions the device-dependent module performs at each entry point are:

**DDM entry point**  
**MSC**

**DM01**

Setup output buffer for a write or send operation

**DM02**

Error check last output operation

**DM03**

Setup to obtain input from the link

**DM04**

Error check an input operation

**DM05**

Not used

**DM06**

Not used

**DM07**

Connect or disconnect the link

**DM0I**

An access method is entered from the device-dependent module

Several entry points are not used to preserve a commonality between coupling communication and terminal communication functions.

The following table summarizes the MSC communication task trace.

*Table 132. Multiple Systems Coupling communication task trace*

| <b>Traced by</b> | <b>Entry point</b> | <b>Function</b>                 | <b>Trace indent</b> |
|------------------|--------------------|---------------------------------|---------------------|
| DFSCMS00         | DFSCMA01           | Process Input                   | AM01                |
| DFSCMS00         | DFSCMA02           |                                 | AM02                |
| DFSCMS00         | DFSCMA03           | What's Next?                    | AM03                |
| DFSCMS00         | DFSCMA05           |                                 | AM05                |
| DFSCMS00         | DFSCMA06           | After Good Write                | AM06                |
| DFSCMS00         | DFSCMA08           | Wash Message                    | AM08                |
| DFSCMS00         | DFSCMA09           | Generate Message                | AM09                |
| DFSCMS00         | DFSCIO10           | Quiesce Link                    | AM10                |
| DFSCMS00         | DFSCIO12           | Wait for I/O or Message Enqueue | AM12                |
| DFSCMS00         | DFSCIOC0           | Get Work Buffer                 | CM00                |
| DFSCMS00         | DFSCIOC0           | Reposition Queue Buffer         | CM01                |
| DFSCMS00         | DFSCIOC0           | Get Next                        | CM02                |
| DFSCMS00         | DFSCIOC0           | Dequeue Message                 | CM03                |
| DFSCMS00         | DFSCIOC0           | Wash Output                     | CM04                |
| DFSCMS00         | DFSCIOC0           | Find Output                     | CM05                |
| DFSCMS00         | DFSCIOC0           | Get New Output                  | CM06                |
| DFSCMS00         | DFSCIOC0           | Free Input Queue Buffer         | CM07                |
| DFSCMS00         | DFSCIOC0           | Free Work Buffer                | CM08                |
| DFSCMS80         | DFSCMS80           | Abort Processing (First LTB)    | MSS1                |
| DFSCMS80         | DFSCMS80           | Abort Processing (Second LTB)   | MSS2                |
| DFSCMS81         | DFSCMS81           | Prior to DDM I/O                | DM0I                |



Table 132. Multiple Systems Coupling communication task trace (continued)

| Traced by | Entry point | Function                                              | Trace indent |
|-----------|-------------|-------------------------------------------------------|--------------|
| DFSCMS00  | DFSCIO03;06 | Write Setup                                           | DM01         |
| DFSCMS00  | DFSCIO00    | Write Interrupt                                       | DM02         |
| DFSCMS00  | DFSCIO01;03 | Read Setup                                            | DM03         |
| DFSCMS00  | DFSCIO00    | Read Interrupt                                        | DM04         |
| DFSCMS00  | DFSCIO00;03 | Connect/Disconnect I/O Interrupt                      | DM07         |
| DFSCMEIO  | DFSCMEIO    | Message Control/Error exit processing                 | CMEI         |
| DFSCMEIO  | DFSCMEIO    | Before calling Message Control/Error exit<br>DFSCMUX0 | CMEA         |
| DFSCMEIO  | DFSCMEIO    | After calling Message Control/Error exit<br>DFSCMUX0  | CMEB         |

## Multiple Systems Coupling traces

Multiple Systems Coupling traces include MSC Message Processing trace, Main storage-to-main storage access method trace, and Main storage-to-main storage save set trace.

### MSC Message Processing Trace—BUFMSRA

The MSC message processing trace records the SYSIDs of the last four IMS systems that processed the MSC message (that is, a BMP or MPP issued a GET UNIQUE to the message queue). The trace is located in the MSC message prefix at label BUFMSRA within the BUFMS DSECT. The trace contains up to four 1-byte SYSID entries. The low-order byte contains the most recent entry. The initial entry contains the SYSID of the system to which the inputting terminal is attached. Each additional entry results in a shift left (the high-order byte is shifted out).

The SYSID is increased to 2 bytes and it is traced in field MSGMETRA of the MSC extension in DSECT MSGMSCE. If the SYSID is less than 256, it is traced both in field BUFMSRA and MSGMETRA for compatibility. If the SYSID is greater than 255, it is only traced in MSGMETRA; field BUFMSRA contains zeros.

### Main storage-to-main storage access method trace

The main storage-to-main storage access method trace records information related to the main storage-to-main storage access method, DFSMTMA0, and the main storage-to-main storage device-dependent module, DFSDN540. The trace is located in global storage pointed to by the "MTMWINDOW" and copied to module DFSMTMTR during abend processing. The following locates the trace:

- TTOP—Table beginning
- TPTR—Next entry to be used
- TBOT—Table end

The trace is a wraparound trace. Each entry is 192 bytes long and contains information such as function, return code, and control blocks. The TRACEMAP DSECT contains further details on entry contents. TRACEMAP is embedded in macro INTFMTMA. Trace operation is controlled by a global SETC labeled within DFSMTMA0. The default assembly value is ON.

### Main storage-to-main storage save set trace

DSECT SAVWORK describes a key work area used by DFSMTMA0. This work area is chained into the standard IMS save set chain with a SAVE ID of MTMWORKAREA. The trace appears in the save set chain even when the trace is set. The SAVWORK DSECT is embedded within macro INTFMTMA.

## Diagnosing link problems

---

Turn traces on for the appropriate lines from either the IMS master terminal or, if you are using type-2 commands, from the Operations Manager (OM) API. Trace all terminals on a line.

For example, use either of the following commands:

- /TRACE SET ON LEVEL 4 MODULE ALL LINK or UPDATE MSLINK NAME(linkname|linkname\*|\*) START(TRACE)

**Note:** The type-2 command UPDATE MSLINK NAME(*linkname*) START(TRACE) uses the same level and module settings that were used the last time the /TRACE SET (ON) LINK command was issued. If a /TRACE SET (ON) LINK command has not been issued since the last cold start, this command defaults to MODULE=ALL and LEVEL=4.

- /TRACE SET OFF LINK x or UPDATE MSLINK NAME(linkname) STOP(TRACE)

Two report types are generated:

### Summary

Contains the average response time, in milliseconds (msec), of the total number of send and receive data values for each link trace.

### Detail

Contains the individual response times, in milliseconds (msec), for every send and receive data value for each MSC link that has been traced.

The formatting of this record is available only if the IMS input log contains X'6701' records that are generated by the /TRACE SET ON LINK command or the type-2 command UPDATE MSLINK NAME(linkname).

For diagnosing link problems, the trace records with the following identifiers are helpful.

### AM01 RECEIPT OF DATA FROM PARTNER SYSTEM

This entry is invoked because the link is stopped (using either the /PSTOP command, the UPDATE MSLINK *linkname* STOP command, or because of an I/O error.

Assemble a copy of DFSADSCT and refer to the BUFMS DSECT in the listing.

#### I TP BUF

Contains the segments received.

#### BUFTFLAG

Indicates more about what was received (that is, first segment).

#### O TP BUF

Contains the data set last sent to the partner.

#### Q BUF

Contains the segments received so far.

#### I WP BUF

Contains the MSC prefix/work buffer.

#### O WP BUF

Contains the MSC prefix/work buffer.

### AM02 ERROR - CHECK LAST OUTPUT OPERATION

#### I WP BUF

Contains the MSC prefix/work buffer.

#### O WP BUF

Contains the MSC prefix/work buffer.

### AM03 MSC ANALYZER 'WHAT NEXT'

If this entry is invoked from a device-dependent module, it is because the device-dependent module has nothing else to do.

Example: EOT received to ACK. Neither side sending; therefore, let the analyzer decide what to do.

Example: A data block containing only the message prefix was received (no segment could fit in the remaining buffer space). The device-dependent module goes to AM03 because there might be output that can be sent. Data response to data is okay.

If this entry is invoked from another analyzer entry point, it is because that function is complete.

Example: After the dequeue of an output message, ENTRY 6 goes to AM03 to see if more output can be initiated.

**CLBCNTQB**

Is a QCB for a destination that has messages queued to be sent across the link.

**CLB3INP and/or CTBAINP**

Indicates that the device-dependent module is not able to send any output data.

**CTBAERR**

Indicates that an error message is to be sent to the partner.

**I WP BUF**

Contains the MSC prefix/work buffer.

**O WP BUF**

Contains the MSC prefix/work buffer.

*AM05 MSC ANALYZER ENTRY 5*

This entry is invoked from the device-dependent module to send a message.

**O TP BUF**

Contains the data last sent to the partner.

**I WP BUF**

Contains the MSC prefix/work buffer.

**O WP BUF**

Contains the MSC prefix/work buffer.

*AM06 LAST OUTPUT OPERATION SUCCESSFUL*

This entry is invoked from the device-dependent module when the previous output was successful.

**CTBAEOM=1**

Indicates that the previous output included the last piece of the message, and that the message is to be dequeued.

**CTBAEOM=0**

Indicates that the last piece of the message has not been sent. No dequeue is to take place. The device-dependent module is dispatched at DM01 to attempt to continue transmitting.

*AM08 CANCEL MESSAGE ENQUEUE OPERATION*

There is a probable contention situation, and this partner must yield. The output message in progress is returned ("washed back") to the queues to be sent later.

**O TP BUF**

Contains the data that the device-dependent module was attempting to transmit.

*AM09 GENERATE AN ERROR MESSAGE*

**I WP BUF**

Contains the MSC prefix/work buffer.

**O WP BUF**

Contains the MSC prefix/work buffer.

*AM10 LINK SHUTDOWN: OPERATOR INTERVENTION REQUIRED*

This entry is invoked because the link is PSTOPPED (either using the /PSTOP command, the UPDATE MSLINK NAME(*linkname*) STOP(COMM) command, or because of an I/O error). Find the previous

device-dependent module interrupt entry (DM02, DM04 or DM07) to determine why the device-dependent module went to AM10.

General cleanup is performed: Queue buffers and I/O buffers are released.

#### *AM12 NORMAL 'LINK IDLE' CONDITION*

This entry is invoked when the device-dependent module has nothing else to do under normal conditions.

Example: MTM link is attention driven. There is no outstanding READ as with BSC. When the device-dependent module has no more data to send and no pending acknowledgment, it becomes idle to wait for a POST by either the enqueue of output or an attention from the partner. This entry is different from AM10 because the analyzer does not complete a general cleanup.

#### *CM00 GET A WORK BUFFER*

This analyzer entry is called when the device-dependent module needs additional space to perform message editing. An example is the collecting of all pieces of a SPA.

#### *CM01 REPOSITION QUEUE BUFFER*

This analyzer entry is called when the device-dependent module wants to ensure that the queue buffer is in storage. This entry is currently not used.

#### *CM02 GET NEXT*

This analyzer entry is called when the device-dependent module needs the next output segment of a message.

#### *CM03 DEQUEUE MESSAGE*

This analyzer entry is called when the device-dependent module wants to dequeue a message (rather than let the analyzer do it). An example is the emergency restart of a link. The device-dependent modules exchange message sequence numbers. If one device-dependent module determines that a message in its queues has already been received by the partner, the message is dequeued to prevent it from being sent twice.

#### *CM04 WASH OUTPUT MESSAGE*

This analyzer entry is called when the device-dependent module wants to return an in-process message to the queues. An example is a permanent I/O error. The device-dependent module washes any output in progress and is sent again after the error recovery sequence completes.

#### *CM05 DETERMINE IF QUEUED OUTPUT IS PRESENT ON A LINK*

This analyzer entry is called when it must be determined if there is any (more) queued output to be sent across the link emergency restart processing. If one device-dependent module determines that a message in its queue has already been received by the partner, the device-dependent module issues a get unique (GU) call (for positioning) followed by a DEQUEUE (CM03) to get rid of the message.

#### *CM06 GET NEW MESSAGE*

The system issues a get unique (GU) call to get a new output message.

#### *CM07 FREE INPUT QUEUE BUFFER*

This analyzer entry is called when the device-dependent module wants to cancel an input queue buffer. An example is permanent I/O error. The device-dependent module discards all input segments that, up to the point of failure, have been collected in queue buffers. The message is lost on this system, and the ABORT sequence sent to the partner tells the partner that the message must be sent again later.

#### *CM08 FREE A WORK BUFFER*

This analyzer entry is called when the device-dependent module wants to free an extra work buffer. This entry is currently not used because the buffer mentioned in the CM00 description is automatically freed by the analyzer.

#### *CM09 GET A PREFIX/WORK BUFFER*

The system obtains a prefix or work buffer.

*CM10 FREE A PREFIX/WORK BUFFER*

The system frees a prefix or work buffer.

*CM11 QUEUE ERROR*

The system processes a QMGR message queue error and issues message DFS082.

*CM12 GLOBAL WASH*

The system issues a CANCEL OUTPUT call to clear the global queue in a shared-queues environment.

*CM13 INSERT MESSAGE*

The system inserts an input message to the message queue.

*CM14 ENQUEUE A MESSAGE*

The system enqueues an input message to the message queue.

*CM15 REREAD MESSAGE*

The system reads an output message from the shared queues again.

*CM16 GET MESSAGE BY DRRN*

The system gets the message with the specified device relative record number (DRRN).

*CM17 GET LINK INPUT/OUTPUT BUFFERS*

The system obtains link I/O buffers.

*CM18 FREE LINK INPUT/OUTPUT BUFFERS*

The system frees link I/O buffers.

*DM01 WRITE SETUP*

The device-dependent module is entered here when the MSC analyzer finds output to be sent and the link is available (CLB3INP off).

Assemble a copy of DFSADSCT and refer to the BUFMS DSECT in the listing.

**Q BUF**

Contains the segments to be sent.

**O TP BUF**

Contains the data stream ready to be sent.

**I TP BUF**

Contains any data received from the partner.

*DM02 WRITE INTERRUPT*

The device-dependent module is entered here at the completion of a logical write operation.

**DECSDECB**

Contains the completion code.

**BUFTYPE**

Contains more information about the type of completion (MTM).

**O TP BUF**

Contains the data stream sent to the partner.

**I TP BUF**

Contains any data received from the partner.

**I WP BUF**

Contains the MSC prefix/work buffer.

**O WP BUF**

Contains the MSC prefix/work buffer.

*DM03 READ SETUP*

The device-dependent module is entered here when the MSC analyzer determines there is no output that can be sent. MTM and CTC are attention driven, and no I/O is initiated here.

#### *DM04 READ INTERRUPT*

The device-dependent module is entered here at the completion of a logical read operation.

#### **DECSDECB**

Contains completion code.

#### **BUFTYPE**

Contains more information about the type of completion (MTM).

#### **DECTYPE**

Indicates the type of the last operation.

#### **I TP BUF**

Contains the data just read.

#### **O TP BUF**

Contains any data sent to the partner in response to a previous read completion.

#### **I WP BUF**

Contains the MSC prefix/work buffer.

#### **O WP BUF**

Contains the MSC prefix/work buffer.

#### *DM07 RESTART*

The device-dependent module is entered here from the MSC analyzer whenever the link is not active (CRB1ACT is not equal to X'11').

#### **DECTYPE**

Indicates the type of the last operation attempted.

#### **DECSDECB**

If I/O is completed, this indicates status.

#### **I TP BUF**

Contains the last data read.

#### **O TP BUF**

Contains the data to write or the data last written.

#### **I WP BUF**

Contains the MSC prefix/work buffer.

#### **O WP BUF**

Contains the MSC prefix/work buffer.

#### *DM0I ENTRY TO ACCESS METHOD*

This record is traced at entry to the access method from the device-dependent module.

#### **DECTYPE**

Indicates the type of operation.

#### **O TP BUF**

If output, contains data to be written.

## **Diagnosing link problems by using MSC link statistics**

You can use MSC link statistics to diagnose link performance problems; determine the message sizes that are sent and received on an MSC link and use this information to determine the link and message queue buffer sizes to use; run benchmarks to determine how many parallel MSC links are needed, and to provide comparisons to use for diagnosing performance problems; and determine the amount of MSC work (such as messages and I/Os) and resources that are being used.

MSC link statistics are kept in the MSC work area, and are pointed to by field CLBMSCWA of the link LLB. This work area is called the DFSMSCWA area. Link statistics from the DFSMSCWA area are logged at

checkpoint with type X'4513' log records. Each X'4513' log record is for a separate link. To assemble DSECTs of these three areas (the LLB, the DFSMSCWA work area, and the X'4513' log records), assemble the following source:

```
CSECT
ICLI CLBBASE=0           Map CLB/LLB
DFSMSCWA FUNC=DSECT     MAP DFSMSCWA work area
DFSL4513 FUNC=DSECT     Map 4513 log record
END
```

The DFSMSCWA area contains two areas for statistics:

### MAIN statistics area

A continuous record of link statistics for logging. Statistics start recording at IMS restart (cold or warm). This area is not reset unless a statistics field overflows. When a statistics field overflows, the field is reset to zero, and a flag is set to indicate that the counter overflowed. The flag remains on until the next IMS checkpoint (and statistics records are logged) and then is reset.

### COPY area

A mirror of the main area. This area is for the QUERY MSLINK SHOW STATISTICS command. The copy area is copied from the main area whenever the query statistics are reset. Query statistics are reset at IMS checkpoints if the reset mode is RESET,CHKPT, or by the command UPDATE MSLINK NAME() START(STATISTICS OPTION(RESET)). The QUERY command always uses the difference of the MAIN statistics area minus the COPY area, so copying MAIN to COPY resets the QUERY (COPY) statistics without affecting the logging (main area).

The following table shows the key labels for statistics in the DFSMSCWA area.

Table 133. Descriptions of key labels for statistics in the DFSMSCWA area

| Area                                          | Label           | Description                                                   |
|-----------------------------------------------|-----------------|---------------------------------------------------------------|
| LLB - Logical link control block              | CLBMSCWA        | Points to DFSMSCWA                                            |
|                                               | CLBNAME2        | Logical link name                                             |
| DFSMSCWA - MSC work area for the logical link | MSCWA_ID        | Beginning, = characters = DFSMSCWA                            |
|                                               | STAT_FLAG1      | Start of main statistics                                      |
|                                               | MSCWA_STARTTIM  | Start main general statistics                                 |
|                                               | MSCWA_SEND#     | Start main send statistics                                    |
|                                               | MSCWA_REC#      | Start main receive statistics                                 |
|                                               | MSCPY_STARTTIM  | Start copy general statistics                                 |
|                                               | MSCPY_SEND#     | Start copy send statistics                                    |
|                                               | MSCPY_REC#      | Start copy receive statistics                                 |
| DFSL4513 - Log X'4513' area                   | ST4513          | Beginning                                                     |
|                                               | ST4513_TYPE     | Log record code = X'4513'                                     |
|                                               | ST4513_LNKNAME  | Logical link name                                             |
|                                               | ST4513_LNKNUM   | Logical link number                                           |
|                                               | ST4513_FLAG1    | Main statistics reset flags from DFSMSCWA<br>STAT_FLAG1       |
|                                               | ST4513_STARTTIM | Start main general statistics from DFSMSCWA<br>MSCWA_STARTTIM |

Table 133. Descriptions of key labels for statistics in the DFSMSCWA area (continued)

| Area | Label        | Description                                            |
|------|--------------|--------------------------------------------------------|
|      | ST4513_SEND# | Start main send statistics from DFSMSCWA MSCWA_SEND#   |
|      | ST4513_REC#  | Start main receive statistics from DFSMSCWA MSCWA_REC# |

Three categories of link statistics are kept for each logical link:

- General statistics, such as statistics start time, ITASK dispatch counts, ITASK processing times, and the rate and number of logger check writes.
- Send statistics, such as messages sent, byte count sent, send message sizes, Queue Manager get counts and times, and send I/O times.
- Receive statistics, such as messages received, byte count received, receive message sizes, Queue Manager insert counts and times, and receive I/O times.

## MSS1 and MSS2 records

MSS1 and MSS2 records are created as a result of ABORT processing when an I/O error (correctable or not) occurs. All available control blocks are snapped, regardless of any trace options in effect on the link involved.

These records are followed by a type X'03' record containing the message that was sent to the master terminal as a result of the error.

The following table shows the significant control blocks snapped in MSS1 and MSS2 records.

Table 134. Significant fields in MSS1 and MSS2 records

| Link type | Control blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CTC       | <p>POST code (first word of LLB)<br/> DECTYPE<br/> LLB, LTB(S), LCB, LXB, CRB, CTT, LNB control blocks<br/> IOSB<br/> MSCWA (MSC work area)<br/> I_WP_BUF, O_WP_BUF</p> <p>I/O buffers (input and output). In non-bandwidth mode, the I/O buffers include I_TP_BUF and O_TP_BUF. In bandwidth mode, the input and output I/O buffers include:</p> <ul style="list-style-type: none"> <li>• I_BUFHDR, O_BUFHDR Send and receive buffer headers</li> <li>• BUFRSP Response data</li> <li>• BUFMSG Message data</li> <li>• BUFERR Error message data</li> <li>• BUFRST Restart data</li> <li>• BUFQUI Shutdown data</li> <li>• BUFUNK Unknown data</li> </ul> |



Table 134. Significant fields in MSS1 and MSS2 records (continued)

| Link type | Control blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MTM       | <p>POST code (first word of LLB)<br/> DECTYPE<br/> LLB, LTB(S), LCB, LXB, CRB, CTT, LNB control blocks<br/> MSCWA (MSC work area)<br/> I_WP_BUF, O_WP_BUF</p> <p>I/O buffers (input and output). In non-bandwidth mode, the I/O buffers include I_TP_BUF and O_TP_BUF. In bandwidth mode, the input and output I/O buffers include:</p> <ul style="list-style-type: none"> <li>• I_BUFHDR, O_BUFHDR Send and receive buffer headers</li> <li>• BUFRSP Response data</li> <li>• BUFMSG Message data</li> <li>• BUFERR Error message data</li> <li>• BUFRST Restart data</li> <li>• BUFQUI Shutdown data</li> <li>• BUFUNK Unknown data</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| TCP/IP    | <p>POST code (first word of LLB)<br/> LLB, LTB(S), LCB, LXB, CRB, CTT, LNB control blocks<br/> MSCWA (MSC work area)<br/> I_WP_BUF, O_WP_BUF<br/> SCIWORK (SCI work area)</p> <p>I/O buffers (input and output). In non-bandwidth mode, the I/O buffers include I_TP_BUF and O_TP_BUF. In bandwidth mode, the input and output I/O buffers include:</p> <ul style="list-style-type: none"> <li>• I_BUFHDR, O_BUFHDR Send and receive buffer headers</li> <li>• BUFRSP Response data</li> <li>• BUFMSG Message data</li> <li>• BUFERR Error message data</li> <li>• BUFRST Restart data</li> <li>• BUFQUI Shutdown data</li> <li>• BUFUNK Unknown data</li> </ul> <p>DFSAWE, the input AWE from the CSL SCI Input message exit. This AWE chain is initially queued to the LXBAWEHDR, then moved over to CLBQE by the TCP/IP post handler DFSTCP20 for processing by the DDM. The AWE is mapped by the DFSAWEXI macro. The AWXI_MBRPLPTR field contains the DFSMSDIR parameter list from SCI.</p> <p>DFSMSDIR, the parameter list of doubleword parameters, containing the length and address of the parameters that are passed between MSC and IMS Connect through the SCI interface.</p> <p>ICONDATA, the data from IMS Connect, pointed to by the DFSMSDIR parameter MDIR_ICONMSGPTR. This data is mapped by the BUFMS macro, starting at BUFMSHDR.</p> |

---

Table 134. Significant fields in MSS1 and MSS2 records (continued)

---

| Link type | Control blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VTAM      | <p>POST code (first word of LLB)<br/>LLB, LTB(S), LCB, LXB, CRB, CTT, LNB control blocks<br/>MSCWA (MSC work area)<br/>I_WP_BUF, O_WP_BUF<br/>RPLs (request parameter list)</p> <p>I/O buffers (input and output). In non-bandwidth mode, the I/O buffers include I_TP_BUF and O_TP_BUF. In bandwidth mode, the input and output I/O buffers include:</p> <ul style="list-style-type: none"><li>• I_BUFHDR, O_BUFHDR Send and receive buffer headers</li><li>• BUFRSP Response data</li><li>• BUFMSG Message data</li><li>• BUFERR Error message data</li><li>• BUFRST Restart data</li><li>• BUFQUI Shutdown data</li><li>• BUFUNK Unknown data</li></ul> |

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#### Related reference

“MSS3 and MSS4 records” on page 444

The MSS3 and MSS4 records capture link control blocks when links are started and stopped. MSS3 captures information when links are stopped. MSS4 captures information when the links are started.

## MSS3 and MSS4 records

---

The MSS3 and MSS4 records capture link control blocks when links are started and stopped. MSS3 captures information when links are stopped. MSS4 captures information when the links are started.

MSC always logs the MSS3 and MSS4 records for diagnostics, even when a link trace is not active.

### MSS3

The MSS3 record is a snapshot of the MSC link incore trace buffer for CTC, VTAM, and TCP/IP links taken each time a link stops, either normally or due to an error.

The MSC link incore trace buffer, which is a wrap-around type buffer, contains data from selected fields in the link and I/O control blocks. MSC writes the data to the buffer each time a link is dispatched to do work and each time the link exits after completing the work. When the buffer is full, MSC wraps around and overwrites the oldest data in the buffer. Module DFSCMS80 contains the DSECTS of the selected fields that are written to the MSC link incore trace buffer.

The MSS3 record captures data from the following control blocks:

- LLB (logical link block)
- LTBs (link terminal blocks), input and output
- CRB (communication restart block)
- LXB (link extension block)
- I/O control blocks:
  - For CTC-type links: IOSB, IOB, and IEDB
  - For TCP/IP type links: SCIWORK
  - For VTAM type-links: input and output RPLs (request parameter lists)

- R0 trace word

## MSS4

The MSS4 record is a snapshot of link control blocks taken each time a link is started. The MSS4 record captures the following control blocks:

- LLB
- MSCWA
- LTBs, input and output
- I/O buffers, input and output
- LXB
- CRB
- I/O control blocks:
  - For CTC-type links: IOSB
  - For TCP/IP type links: SCIWORk
  - For VTAM type-links: RPLs, input and output
- LNB (link name block for the MSNAME)
- CTT (communication terminal table block)

### Related reference

[“MSS1 and MSS2 records” on page 442](#)

MSS1 and MSS2 records are created as a result of ABORT processing when an I/O error (correctable or not) occurs. All available control blocks are snapped, regardless of any trace options in effect on the link involved.

## Channel-to-channel access method trace stack (LXB trace)

---

The LXB trace stack is designed to be used in conjunction with the module listings to provide a detailed trace of instruction flow through the channel-to-channel (CTC) access method.

The trace stack is located in the LXB at label LXBCTRAC, 288 (X'E4') bytes into the LXB, and is 50 bytes long. The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The code that manipulates the LXB trace stack is unconditionally operative. (That is, it is not conditionally assembled and the function is not controlled by the operator command.) If level 3 or 4 of the IMS trace command is in effect, the LXB is included among the areas traced to the log.

Most LXB trace stack entries are 2 bytes long; a few are 1 byte long. Usually, each invocation of one of the access method modules causes a trace entry to be placed in the LXB trace stack. In order to create a trace entry, the module first moves (pushes) the trace stack 2 (or 1) bytes backward (toward low storage), thereby deleting the oldest portions of the trace stack. The module then inserts the new entry at the high (storage address) end of the trace stack. In rare instances, when the asynchronous modules DFSCMC40 and DFSCMC10 interrupt execution of another CTC access method module, the trace entries might overlap and thus might not be meaningful.

The format and meaning of the possible LXB trace entries follow:

### Byte 1, bit 0

If on, this is a 2-byte entry; otherwise it is a 1-byte entry.

### Byte 1, bits 1-3

This identifies the module and, if applicable, the routine within the module that made the entry in the LXB.

### Value

### Meaning

- 1** DFSCMC40, attention DIE routine
- 2** DFSCMC10, channel-end appendage
- 3** DFSCMC10, abnormal-end appendage
- 4** DFSCMC40, I/O request DIE routine
- 5** DFSCMC10, shutdown appendage
- 6** DFSCMC50, shutdown processing routine
- 7** DFSCMC00, MSC analyzer

**Byte 1, bits 4-7**

This identifies what processing was performed. The meaning of the bits, as shown below, is dependent on the routine that made the entry in the LXB.

**Byte 2**

This is an input byte that the routine keys on. This is also dependent on the routine and is described below.

**DFSCMC00 (MSC analyzer)**

The DFSCMC00 module manipulates the LXB trace stack.

**Byte 1, bits 4-7**

**Value**

**Meaning**

- 0** No I/O operation was queued; contention exists for the CTC adapter
- 1** WRITE channel program was queued
- 2** ACK channel program was queued
- 3** WRACK channel program was queued
- 4** READ channel program was queued; contention exists for use of the CTC adapter
- 5** STARTUP channel program was modified to be a WRITE channel program
- 6** Old STARTUP channel program was modified to be a WRITE channel program
- 7** WRITE channel program was not queued; write-pending switch was set
- 8** Error return was given

**Byte 2**

This contains the operation code (found in DECTYPE+1).

## DFSCMC50 (shutdown processing routine)

The module DFSCMC50 manipulates the LXB trace stack.

### Byte 1, bits 4-7

#### Value

#### Meaning

- 1** Normal STACK operation was performed
- 2** Normal SHUTDOWN operation was performed
- 3** Abnormal SHUTDOWN occurred

### Byte 2

This contains the operation code (found in DECTYPE+1).

## DFSCMC40 (attention DIE routine)

The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The values and meaning of DFSCMC40 are listed.

### Byte 1, bits 4-7

IOSB was passed to IOS to perform a read.

#### Value

#### Meaning

- 0** Error was previously posted
- 1** IOSB was passed to IOS
- 2** IOSB on queue was modified to perform a read
- 3** LLB was posted with ACK received
- 4** LXB was posted with STARTUP complete; the link is available for a WRITE operation
- 5** LXB was posted with an error
- 6** LLB was posted with an error
- 7** During STARTUP processing, a control command was received after this routine used a no-operation command
- 8** Attention interrupt was received during SHUTDOWN processing; UCB was already cleared
- 9** Attention interrupt was received during SHUTDOWN processing; this routine did not reset UCBQISCE switch
- A** Attention interrupt was received during SHUTDOWN processing; this routine did not reset UCBQISCE switch
- B** Attention interrupt was received during SHUTDOWN processing; this routine scheduled an IOSB

- C** Attention interrupt was received during SHUTDOWN processing; this routine set LXBC2XS switch
- D** LXBC2SD switch was set after an attention interrupt because a WRITE command was received; READ operation was not done
- E** Read-pending or response-received switch was set
- F** Attention interrupt was received during SHUTDOWN processing; SHUTDOWN channel program was aborted

**Byte 2**

The command byte is sensed from the channel-to-channel adapter (found at IOSCTCMD), except when an I/O error prevented retrieval of the command byte, in which case byte 2 is absent.

**DFSCNC40 (I/O request DIE routine)**

The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The values and meaning of DFSCNC40 are listed.

**Byte 1, bits 4-7**

| <b>Value</b> | <b>Meaning</b>                                                                          |
|--------------|-----------------------------------------------------------------------------------------|
| <b>0</b>     | Second entry into this routine was taken; nothing was done                              |
| <b>1</b>     | LXBCLIB switch was reset                                                                |
| <b>2</b>     | IOSB on queue was modified to perform a WRITE operation (this is always a 1-byte entry) |

**DFSCMC10 (channel-end appendage)**

The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The values and meaning of DFSCMC100 are listed.

**Byte 1, bits 4-7**

| <b>Value</b> | <b>Meaning</b>                                                                    |
|--------------|-----------------------------------------------------------------------------------|
| <b>0</b>     | Nothing was done                                                                  |
| <b>1</b>     | LXB was posted with STARTUP complete; the link is available for a WRITE operation |
| <b>2</b>     | LXB was posted with STARTUP complete; STARTUP message was received                |
| <b>3</b>     | During STARTUP processing, no-operation command was scheduled                     |
| <b>5</b>     | LXB was posted; message received                                                  |
| <b>6</b>     | LLB was posted; message received                                                  |
| <b>8</b>     | During STARTUP processing, control command was scheduled                          |
| <b>9</b>     | LLB was posted; an error occurred on message that was written                     |

**A**  
LLB was posted; an error occurred on message that was received

**B**  
LXB was posted; an error occurred on message that was received

**Byte 2**

This contains the first command code in the just-completed channel program (pointed to by IOSVST).

**DFSCMC10 (abnormal-end appendage)**

The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The abnormal values and meaning of DFSCMC100 are listed.

**Byte 1, bits 4-7**

**Value**

**Meaning**

**2**  
Not a permanent error; control is given to an ERP

**3**  
Error was declared permanent

**4**  
Serial channel error

**5**  
MIH detected error before retry

**Byte 2**

This contains the value in IOSCOD.

**DFSCMC10 (shutdown appendage)**

The only modules that manipulate the LXB trace stack are the CTC access method modules, DFSCMC00, DFSCMC10, DFSCMC40, and DFSCMC50. The shutdown values and meaning of DFSCMC100 are listed.

**Byte 1, bits 4-7**

**Value**

**Meaning**

**1**  
Completion was normal; a new I/O operation was scheduled

**2**  
Completion was normal; LLB was posted

**3**  
Completion was abnormal; UCB was already cleared

**4**  
Completion was abnormal; this routine has cleared UCB and posted LLB

**5**  
Completion was abnormal; this routine will restart I/O

**6**  
Completion was abnormal; this routine has restarted I/O

**7**  
Completion was normal; UCB was already cleared

**Byte 2**

This contains the first command code in the just-completed channel program (pointed by IOSVST).

## LXB trace stack example

This example shows a printout of the LXB portion of an internal trace record.

The LXB trace stack begins at AE90E8 and contains 29 entries. Following the figure is a list of the meanings of the routines that made each entry.

### Printout of the LXB trace stack

```
DFSERA30 — FORMATTED LOG PRINT
:
INTERNAL TRACE RECORD
:
LXB
AE9004 000000 807F0BC9 00093660 00AE9350 00AE92B0 00091E90 00AE991C 17000000 7F0C0000
AE9024 000020 80000000 520821CE 0008229C 000820C6 80082194 012141CE 60000054 0A000000
AE9044 000040 30000005 022140C6 600000CE 09000000 30000005 47000000 20000001 00000000
AE9064 000060 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
AE9084 000080 TO AE90C4 0000C0 SAME AS ABOVE
AE90E4 0000E0 00000000 0C419317 F1044193 17F10441 9337E218 D243F510 A314A8C3 419101A2
AE9104 000100 02F30C41 93179101 A502F004 F30C4193 17F10441 93170000 00000000 00B66218
```

#### Entry Meaning

##### X'0C'

The first byte of this entry, the oldest entry in the trace stack, has been pushed off the trace stack. Ignore this entry.

##### X'41'

DFSCMC40 (I/O request DIE). LXBCLIB was reset.

##### X'9317'

DFSCMC40 (attention DIE). Operation code X'17' (ACK) was received from the other system. The LLB was posted X'7F1C0000' (ACK received).

##### X'F104'

DFSCMC00. Operation code X'04' (WRITE) was received. The WRITE channel program was queued.

##### X'41'

DFSCMC40. (I/O request DIE). LXBCLIB was reset. WRITE operation was completed.

##### X'9317'

DFSCMC40 (attention DIE). Operation code X'17' (ACK) was received from the other system. The LLB was posted X'7F1C0000' (ACK received).

##### X'F104'

DFSCMC00. Operation code X'04' (WRITE) was received. The WRITE channel program was queued.

##### X'41'

DFSCMC40 (I/O request DIE). LXBCLIB was reset. WRITE operation was completed.

##### X'9337'

DFSCMC40 (attention DIE). Operation code X'37' (STACK) was received from the other system. The LLB was posted X'7F1C0000' (ACK received).

##### X'E218'

DFSCMC50 (SHUTDOWN processing). Operation code X'18' (SHUTDOWN) was received. Normal SHUTDOWN was performed.

##### X'D243'

DFSCMC10 (SHUTDOWN appendage). Channel command X'43' (enable compatibility) completed normally. The LLB was posted.

##### X'F510'

DFSCMC00. Operation code X'10' (STARTUP) was received. The start-link channel program was queued.



**X'A314'**

DFSCMC10 (channel-end appendage). Channel command X'14' (sense command byte) of the start-link channel program completed normally. The disable compatibility no-operation command was scheduled.

**X'A8C3'**

DFSCMC10 (channel-end appendage). Channel command C'X3' (disable compatibility no-operation) completed normally. The startup control command was scheduled.

**X'41'**

DFSCMC40 (I/O request DIE). LXBCLIB was reset. Channel end was received from the startup control.

**X'9101'**

DFSCMC10 (attention DIE). Operation code X'01' (WRITE) was received from the other system. The IOSB was passed to IOS to initiate a READ.

**X'A202'**

DFSCMC10 (channel-end appendage). Channel command X'02' (read) completed normally. The LXB was posted X'7F080000' (startup complete, startup message received).

**X'F30C'**

DFSCMC00. Operation code X'0C' (WRACK) was received. ACK with data (WRACK) channel program was queued.

**X'41'**

DFSCMC40 (I/O request DIE). LXBCLIB was reset. WRACK operation has completed.

**X'9317'**

DFSCMC40 (attention DIE). Operation code X'17' (ACK) was received from the other system. The LLB was posted X'7F0C0000' (ACK received).

**X'9101'**

DFSCMC40 (attention DIE). Operation code X'01' (WRITE) was received from the other system. The IOSB was passed to IOS to initiate a READ operation.

**X'A502'**

DFSCMC10 (channel-end appendage). Channel command X'02' (read) was completed. The LXB was posted X'7F0C0000' (message received).

**X'F004'**

DFSCMC00. Operation code X'04' (WRITE) was received. No I/O was scheduled. Contention exists between this WRITE operation and the WRITE operation received from the other system in the preceding 9101 entry. The device-dependent module has not yet received control in response to the LXB post traced by the preceding A502 entry.

**X'F30C'**

DFSCMC00. Operation code X'0C' (WRACK) was received. ACK with data (WRACK) channel program was queued.

The ACK acknowledges the data received from the other system in the preceding 9101 entry. The data is the data that was not sent in the preceding F004 entry.

**X'41'**

DFSCMC40 (I/O request DIE). LXBCLIB was reset.

**X'9317'**

DFSCMC40 (attention DIE). Operation code X'17' (ACK) was received from the other system. The LLB was posted X'7F1C0000' (ACK received).

**X'F104'**

DFSCMC00. Operation code X'04' (WRITE) was received. The WRITE channel program was queued.

**X'41'**

DFSCMC40 (I/O request DIE). LXBCLIB was reset. WRITE operation was completed.

**X'9317'**

DFSCMC40 (attention DIE). Operation code X'17' (ACK) was received from the other system. The LLB was posted X'7F1C0000' (ACK received).

## **MSC routing trace - BUFMSVID**

The MSC routing trace is located in the MSC message prefix at label BUFMSVID within the BUFMS DSECT. The low-order byte in the trace contains the most recent entry, and each additional entry results in a shift left (the high-order byte is shifted out).

This trace records the MSVID (as specified in the IMSCTRL macro during system definition) of the last eight IMS systems through which messages were routed. It is initialized when a terminal sends a message or when an application program does an ISRT of a message, and it is updated for each intermediate system and the destination system.

This trace records the primary MTO's local SYSID of the last eight IMS systems through which messages were routed. It is initialized when a terminal sends a message or when an application program does an ISRT of a message, and it is updated for each intermediate system and the destination system. The MSC routing trace is located in the MSC message prefix extension at label MSGMEVID in DSECT MSGMSCE. The low-order byte in the trace contains the most recent entry, and each additional entry results in a shift left (the high-order byte is shifted out). If the SYSID is equal to or greater than 255, it is traced both in field BUFMEVID and MSGMEVID. If the SYSID is less than 255, it is only traced in MSGMEVID; BUFMEVID contains zeros.

# Chapter 17. ODBA - Diagnosing hung threads and UORs

Use the following steps to configure your system to gather data that IBM Software Support can use to determine why IMS threads or UORs are hanging on your system.

1. Turn on the following IMS table traces by using the following IMS commands:

```
/TRACE SET ON TABLE RRST OPTION LOG
/TRACE SET ON TABLE DISP
/TRACE SET ON TABLE SCHD
```

These traces are sent to the IMS OLDS, unless IMS external trace data sets are used. For a test environment, data sent to the OLDS files is appropriate. For production systems, use IMS external tracing. For more information about IMS external tracing, see [Diagnostic setup recommendations for IMS \(System Definition\)](#).

2. If it is not already active with the following options, turn on the MVS SYSRRS CTRACE:
  - a) Place the following lines in the CTIRRSxx PARMLIB member:

```
TRACEOPTS
ON
BUFSIZE(1000M)
OPTIONS('EVENTS(URSERVS, LOGGING, CONTEXT, EXITS, STATECHG, RRSAPI, RE
START)')
```

- b) Issue the following MVS Command:

```
TRACE CT, ON, COMP=SYSRRS, PARM=CTIRRSxx
```

- c) Issue the following MVS Command to display the trace setting:

```
DISPLAY TRACE, COMP=SYSRRS
```

- d) The display output for the SYSRRS portion appears as follows:

```
IEE843I 13.17.07 TRACE DISPLAY 479 SYSTEM STATUS INFORMATION
ST=(ON,1000K,09000K) AS=ON BR=OFF EX=ON MO=OFF MT=(ON,500K)
COMPONENT MODE BUFFER HEAD SUBS
-----
SYSRRS ON 1000M
ASIDS *NONE*
JOBNAMES *NONE*
OPTIONS EVENTS(URSERVS, LOGGING, CONTEXT, EXITS, STATECHG,
RRSAPI, RESTART)
```

**Recommendation:** The MVS CTRACE should always be active on any system using IMS with RRS. The MVS trace command should be added to the MVS COMMNDxx SYS1.PARMLIB member to ensure that it is always activated at IPL time. No performance impacts have been reported with the SYSRRS CTRACE using the above options.

After this trace is activated on your system, future operational dumps of IMS must include the RRS address space in the list of jobs to be dumped along with the RRS data spaces (DSPNAME=('rrsjname'\*)). Doing so ensures that the RRS control blocks and traces can be accessed for diagnostic purposes.

3. Turn GTF trace on with the TRACE=SYS,DSP,JOBNAMEP options.

When GTF Trace prompts for the JOBNAME, specify the JOBNAME for the stored procedure address space and IMS CTL Region. Set the GTF trace dataset to 1200 cylinders.

The GTF Messages should appear similar to the following:

```
START GTFxx.GTF
HASP100 GTFxx.GTF ON STCINRDR
```

```
HASP373 GTFxx.GTF STARTED
*01 AHL100A SPECIFY TRACE OPTIONS
R 01,TRACE=SYS,DSP,JOBNAMEP
IEE600I REPLY TO 01 IS;TRACE=SYS,DSP,JOBNAMEP
*02 ALH101A SPECIFY TRACE EVENT KEYWORDS - JOBNAME=
R 02,JOBNAME=(spasname,ctlname)
IEE600I REPLY TO 02 IS;JOBNAME=(spasname,ctlname)
*03 ALH102A CONTINUE TRACE DEFINITION OR REPLY END
R 03,END
END
IEE600I REPLY TO 03 IS;END
AHL103I TRACE OPTIONS SELECTED-SYS, DSP
AHL103I JOBNAME=(spasname,ctlname)
*04 AHL125A RESPECIFY TRACE OPTIONS OR REPLY U
R 04,U
U
IEE600I REPLY TO 04 IS;U
```

4. Set the following SLIP trap to capture dumps for RRS related events:

```
SLIP SET,C=U0711,
JL=(imsctl,imsdli,rrsjname,???SPW2),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,LPA,ALLNUC),
ID=U711,DSPNAME=('rrsjname'.*),END
```

The variables in the preceding example are defined in the following list.

**imsctl**

The IMS control region jobname

**imsdli**

The IMS DLI region jobname

**rrsjname**

The RRS region jobname

5. Use IMS Display commands for hung threads:

```
- DIS ACTIVE
- DIS CCTL
- DIS UOR
```

6. If a hung ODBA thread or UOR occurs, take a dump of the system so that IBM Software Support can see the related control blocks and access the RRS traces. Use a single dump command as indicated below and not separate dumps for each job.

```
DUMP TITLE=(DUMP IMS/SPAS/RRS)
JOBNAME=(ctlname,spasname,dlijname,rrsjname),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,LPA,ALLNUC,GRSQ),
DSPNAME=('rrsjname'.*),END
```

The variables in the preceding example are defined in the following list.

**ctlname**

The IMS CTL Region jobname

**tspasname**

The stored procedure address space jobname

**dlijname**

The IMS DLI region jobname

**rrsjname**

The RRS region jobname

Tune DUMP MAXSPACE and the SYS1.DUMP space allocation to ensure that your system has sufficient space for the dump.

7. It is important for IBM Software Support to receive all of the requested diagnostic information as a complete unit from a single occurrence with all data centered around the time of the thread or UOR hang. This information typically includes:

- Dump data sets obtained
- IMS OLDS or SLDS
- MVS SYSLOG
- LOGREC data set
- JES JOBLOG for cltname,spasname

After taking the dump, you can free the hung thread using the recommendations in [Stopping Db2 for z/OS stored procedure threads \(Application Programming\)](#).



---

## Chapter 18. RSR - Remote Site Recovery service aids

The RSR tracking process creates a local log that mirrors the activity at the currently active system.

These topics describe the Fast Path tracker trace Entries that can help you analyze problems in a Remote Site Recovery (RSR) environment.

In some cases, however, the tracking system might not receive copies of all log records before takeover. This might happen if there is a tracking session failure before takeover occurs while the active system is still processing transactions normally. If there is a tracking session failure before takeover, subsequent attempts to start Finance, SLU P, and ISC sessions or MSC links might result in resynchronization errors.

The MTO is notified of both non-MSC errors and MSC errors, as follows:

- Message DFS2948 notifies the MTO of non-MSC errors.
- Either message DFS3211 or message DFS3212 notifies the MTO of MSC errors.

Use the remote takeover message information in conjunction with the received log data to determine the last terminal or MSC message recorded by the tracking process. Then input or output any messages that were lost.

---

### Determining the last recorded non-MSC message

You can determine the last input or output non-MSC or non-Fast Path message recorded using RSR tracking and its status within the new active IMS following takeover.

1. Print these log records for information:

- X'01'
- X'03'
- X'31'
- X'35'
- X'36'
- X'37'
- X'63'
- X'66'

2. Determine the last input or output message. First look for the last X'66' or X'63' log record for the terminal.

ISC parallel sessions qualify the node name in the log record with user ID.

If a X'63' log record is last, that log record indicates whether the session was started cold (without message numbers) or warm (with last input/output message numbers).

If a X'66' log record is last, that log record indicates the message sequence number and whether the message was input or output. The X'66' log record marks an attempt to commit the message for recovery and restart, if necessary. Additional log records will indicate the exact status of the message.

3. Determine the last committed input message by inspecting the last X'66' log record marked as input for the specific terminal. It is followed by X'01' and X'35' log records for the input message. The X'35' log record considers the input message (log record X'66') committed, or made recoverable, for input processing on nonresponse mode transactions.

**Restriction:** Nonconversational response mode transactions are not restartable. That is, they must be submitted again to IMS if any failure occurs prior to completion of transaction processing. Therefore, the input is not considered committed until the transaction processing is complete and output is available to send to the terminal (see output process that follows).

4. Before the terminal begins the output process, completion of the input transaction processing results in X'03', ending with X'3730'. The X'3730' commits the transaction changes, including making the output message available for the terminal. The X'3730' also commits the associated nonconversational response mode input transaction, as described previously.

To determine the last committed output message sent to the terminal, begin with the last X'66' marked as output. This output message is committed, that is dequeued, with the X'36' log record that follows, reflecting successful receipt by the terminal.

For Fast Path messages, use the following procedure to determine the last input or output message recorded using RSR tracking.

1. Print these log records for information:

- X'5901'
- X'5903'
- X'5936'
- X'5937'
- X'63'
- X'66'

2. Determine the last input or output message. First look for the last X'66' or X'63' log record for the terminal.

ISC parallel sessions qualify the node name in the log record with user ID.

If a X'63' log record is last, that indicates whether the session was started cold (without message numbers) or warm (with last input/output message numbers).

If a X'66' log record is last, that log record will indicate the message sequence number and whether the message was input or output. The X'66' log record marks an attempt to commit the message for recovery and restart, if necessary. Additional log records will indicate the exact status of the message.

3. Fast Path input is always considered nonrestartable and must be resubmitted to IMS if any failure occurs before transaction input processing is complete and the output message is made available to the terminal output process.
4. To determine the last Fast Path input transaction received and committed, begin with the last X'66' log record that is marked as input for the specific terminal. It is followed by a X'5901' log record with the input message and a X'5937' log record indicating input transaction processing complete. The input and all changes have been committed.
5. To determine the last committed output message to the terminal, begin with the X'5903' log record for the output message followed by the X'5937', which makes it available for the terminal output process. This is the same X'5937' log record that also commits the input above. This is followed by a X'66' log record indicating an attempt to deliver output to the terminal. This output is committed (dequeued) when also followed by the X'5936' log record.

## Determining the last recorded MSC message

---

MSC links keep track of the sending and receiving of data on a message by message basis.

Each message block sent across an MSC link is appended with a sequence number. The IMS receiving system updates its receive count with each message block received, and records (logs) each message successfully received and enqueued to the message queue. Similarly, the sending system updates its sending count with each message block sent and logs the sequence number of the last message successfully sent and dequeued.

Across link restarts, RSR takeovers, or IMS failures, these sequence numbers are exchanged and used to resynchronize the message traffic, to continue sending and receiving messages at the same point. Therefore, messages are not lost or duplicated.



The key to the success of this concept is the logging of the messages that were sent and received across the link, and enqueued on the receiving side and dequeued from the sending side. There are primarily five log records used to resynchronize this message traffic:

- 01 - Input message to IMS - input transaction or message switch
- 03 - Transaction Output, program-to-program switch or error message (DFSxxxx)
- 35 - Enqueue message
- 36 - Dequeue message
- 66 - Message sequence recovery

If log records are lost and not processed by the tracking system prior to a remote takeover, message resynchronization can result in the loss or duplication of messages. This can be evidenced by error messages that are issued by IMS when the links are restarted, such as DFS3211 and DFS3212, DFS2145, and DFS2948.

Should link resynchronization fail after an RSR takeover, it might be possible to analyze which messages were lost or duplicated, from the information in the DFS error message issued by IMS at the time of error, and from the 01, 03, 35, 36, and 66 log records.

## Fast Path tracker trace entries

Use Trace record 9E01 - DBFDT210 redo record processor module entry through Trace record 9F74 - DBFDT400 write to analyze the Fast Path tracker trace entries.

### Trace entry: Fast Path tracker log router interface (9E)

#### 9E01

##### Module:

DBFDT210 Redo Record Processor Module Entry

##### Explanation:

Record cut at entry to DBFDT210 (Level - Medium)

##### Trace Subcode:

DT210 Entry

Table 135. Trace record 9E01 - DBFDT210 redo record processor module entry

| Offset | Type      | Length | Description     |
|--------|-----------|--------|-----------------|
| 0      | Character | 4      | Log Id          |
| 4      | Character | 4      | CI RBA          |
| 8      | Character | 2      | Offset in CI    |
| 10     | Character | 2      | Data Length     |
| 12     | Fixed     | 1      | Stream Id       |
| 13     | Fixed     | 1      | OFR Id          |
| 14     | Fixed     | 2      | Milestone Index |
| 16     | Character | 8      | Prilog Time     |

### Example:

```

DT210 Entry      LSN      streamID  OFRID
                  |         |         |
                  9E018A65 000023AB 00000001 00000000
                  00000090 0094122F 1141138F 8613CD64
                  |
                  milestone prilog time
                  index
  
```

## 9E02

**Module:**

DBFDT220 Redo Record Processor Module Entry

**Explanation:**

Record cut at entry to DBFDT220 (Level - Medium)

**Trace Subcode:**

DT210 Entry

Table 136. Trace record 9E02 - DBFDT220 redo record processor module entry

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
| 0      | Character | 4      | Log Id              |
| 4      | Fixed     | 4      | Stream Type         |
| 8      | Fixed     | 1      | Log Record Type     |
| 8      | Fixed     | 1      | Log Record Sub Type |
| 10     | Fixed     | 2      | Stream Id           |
| 12     | Fixed     | 2      | OFR Id              |
| 14     | Fixed     | 2      | Milestone Index     |
| 16     | Character | 8      | Prilog Time         |

### Trace entry: Fast Path tracker log router interface (9F)

## 9F22

**Module:**

DBFDT300 Fast Path/Fast Path TCB AWE Queue Server Module Entry

**Explanation:**

Record cut at entry to DBFDT300 (Level - High)

**Trace Subcode:**

DT300 Entry

Table 137. Trace record 9F22 - DBFDT300 Fast Path/Fast Path TCB AWE queue server module entry

| Offset | Type      | Length | Description       |
|--------|-----------|--------|-------------------|
| 0      | Address   | 4      | AWE enqueueer     |
| 4      | Character | 4      | AWE function code |
| 8      | Character | 16     | AWE contents      |

**Example:**

```
DT300 Entry    9F22B879  04F9E5E2  00000003  0476A3C0
                00000001  00000002  00000000  A0AFD862
                |      |
                streamID  USID
```

### Trace Entry: Fast Path tracker log router interface (9F)

**Module:**

DBFDT300 Fast Path/Fast Path TCB AWE Queue Server Module Entry

**Explanation:**

Record cut at entry to DBFDT300 (Level - High)

**Trace Subcode:**

DT300 Entry

**9F22***Table 138. Trace record 9F22 - DBFDT300 Fast Path/Fast Path TCB AWE queue server module entry*

| Offset | Type      | Length | Description       |
|--------|-----------|--------|-------------------|
| 0      | Address   | 4      | AWE enqueueer     |
| 4      | Character | 4      | AWE function code |
| 8      | Character | 16     | AWE contents      |

**Example:**

```

DT300 Entry      9F22B879  04F9E5E2  00000003  0476A3C0
                  |         |         |         |
                  00000001  00000002  00000000  A0AFD862
                  |         |
                  streamID  USID

```

**9F41****Module:**

DBFDT180 Area Status Change Module Entry

**Explanation:**

Record cut at entry to DBFDT180 (Level - High)

**Trace Subcode:**

DT180 Entry

*Table 139. Trace record 9F41 - DBFDT180 area status change module entry*

| Offset | Type    | Length | Description   |
|--------|---------|--------|---------------|
| 0      | Fixed   | 4      | Function code |
| 4      | Fixed   | 4      | Reason code   |
| 8      | Address | 4      | Address EMAC  |
| 12     | Address | 4      | Address PST   |

**Example:**

```

DT180 Entry      9F41D6C0  00000001  00000007  041843C0
                  |         |         |         |
                  00B3C060  00000000  00000000  AC97BB2C
                  |
                  PST

```

**9F44****Module:**

DBFROFR0 OFR Module Entry

**Explanation:**

Record cut at entry to DBFROFR0 (Level - High)

**Trace Subcode:**

ROFR0 Entry

Table 140. Trace record 9F44 - DBFROFR0 OFR module entry

| Offset | Type  | Length | Description   |
|--------|-------|--------|---------------|
| 0      | Fixed | 4      | Function code |
| 4      | Fixed | 4      | Area count    |

**Module:**

DBFROFR0 OFR Module Entry

**Explanation:**

Record cut at entry to DBFROFR0 (Level - High)

**Trace Subcode:**

ROFR0 Entry

Table 141. Trace record 9F44 - DBFROFR0 OFR module entry

| Offset | Type    | Length | Description     |
|--------|---------|--------|-----------------|
| 0      | Fixed   | 4      | Function code   |
| 4      | Address | 4      | Address of DMAC |

**Module:**

DBFROFR0 OFR Module Entry

**Explanation:**

Record cut at entry to DBFROFR0 (Level - High)

**Trace Subcode:**

ROFR0 Entry

Table 142. Trace record 9F44 - DBFROFR0 OFR module entry

| Offset | Type  | Length | Description   |
|--------|-------|--------|---------------|
| 0      | Fixed | 4      | Function code |

**9F50**

**Module:**

DBFDT350 IPOST

**Explanation:**

Record cut at IPOST in DBFDT350 (Level - High)

**Trace Subcode:**

DT350 IPOST

Table 143. Trace record 9F50 - DBFDT350 IPOST

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 0      | Character | 4      | Post code   |
| 4      | Address   | 4      | EDBTWAQ     |

**Example:**

```

DT350 IPOSTed  9F508A97  40C6F2F2  02E85E40  00000000
                 |          |          |          |
                 post code  EDBTWAQ
                 |          |
                 00000000  00000000  00000000  8613ED2D

```

## 9F51

**Module:**

DBFDT350 IWAIT

**Explanation:**

Record cut at IWAIT in DBFDT350 (Level - High)

**Trace Subcode:**

DT350 IWAIT

Table 144. Trace record 9F51 - DBFDT350 IWAIT

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 0      | Character | 4      | Post code        |
| 4      | Address   | 4      | EDBTWAQ contents |

**Example:**

```
DT350 IWAIT      9F512DA3  00000000  846761EC  00000000
                  00000000  00000000  00000000  32DC4B1C
                  |
                  EDBTWAQ
```

## 9F52

**Module:**

DBFDT350 GETEMAC

**Explanation:**

Record cut at EMAC in DBFDT350 (Level - High)

**Trace Subcode:**

DT350 EMAC

Table 145. Trace record 9F52 - DBFDT350 GETEMAC

| Offset | Type    | Length | Description         |
|--------|---------|--------|---------------------|
| 0      | Address | 4      | Address EMAC        |
| 4      | Address | 4      | EMACEMAC WAQ        |
| 8      | Address | 4      | EMACERQE WAQ        |
| 12     | Address | 4      | EMACERQE WIOQ       |
| 16     | Fixed   | 4      | EMACERQE WIOQ count |

**Example:**

```
DT350 GETEMAC    9F528A98  02E85E40  0329B1E4  0000A740
                  00006000  0000000E  00000000  8613ED6C
                  |
                  EMACERQE_WIOQ count
                  |
                  EMACERQE_WIOQ
```

## 9F53

**Module:**

DBFDT350 GETERQE

**Explanation:**

Record cut at ERQE in DBFDT350 (Level - Medium)

**Trace Subcode:**  
DT350 ERQE

Table 146. Trace record 9F53 - DBFDT350 GETERQE

| Offset | Type      | Length | Description    |
|--------|-----------|--------|----------------|
| 0      | Address   | 4      | Address ERQE   |
| 4      | Address   | 4      | ERQEEMAC       |
| 8      | Fixed     | 1      | ERQE Type      |
| 9      | Fixed     | 1      | ERQEF          |
| 10     | Fixed     | 1      | ERQEF2         |
| 12     | Fixed     | 4      | ERQEMILE Index |
| 16     | Character | 8      | Log Record Id  |

**Example:**

```

DT350 GETERQE  9F538A9A  0000B180  02E85E40  01080000
                00000000  00000000  00000090  8613EDE9
                                |
                                milestone index
                                type
                                | flags

```

**9F54**

**Module:**

DBFDT350 EMAC2

**Explanation:**

Record cut at EMAC in DBFDT350 (Level - High)

**Trace Subcode:**

DT350 EMAC2

Table 147. Trace record 9F54 - DBFDT350 EMAC2

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 0      | Character | 8      | Area name   |

**Example:**

```

DT350 EMAC2  9F548A99  C4C4F0F1  C1D9F040  00000000
                00000000  00000000  00000000  8613ED9D
                                |
                                Area name

```

**9F70**

**Module:**

DBFDT400 IPOST

**Explanation:**

Record cut at IPOST in DBFDT400 (Level - High)

**Trace Subcode:**

DT400 IPOST

Table 148. Trace record 9F70 - DBFDT400 IPOST

| Offset | Type      | Length | Description  |
|--------|-----------|--------|--------------|
| 0      | Address   | 4      | Address IOTI |
| 4      | Character | 4      | Post code    |

**9F71**

**Module:**

DBFDT400 IWAIT

**Explanation:**

Record cut at IWAIT in DBFDT400 (Level - High)

**Trace Subcode:**

DT400 IWAIT

Table 149. Trace record 9F71 - DBFDT400 IWAIT

| Offset | Type    | Length | Description  |
|--------|---------|--------|--------------|
| 0      | Address | 4      | Address IOTI |

**9F72**

**Module:**

DBFDT400 EMAC

**Explanation:**

Record cut for EMAC in DBFDT400 (Level - High)

**Trace Subcode:**

DT400 EMAC

Table 150. Trace record 9F72 - DBFDT400 EMAC

| Offset | Type    | Length | Description              |
|--------|---------|--------|--------------------------|
| 0      | Address | 4      | Address IOTI             |
| 4      | Address | 4      | Address EMAC             |
| 8      | Fixed   | 4      | EDBT Milestone IOTI Done |

**9F73**

**Module:**

DBFDT400 Read

**Explanation:**

Record cut at Read in DBFDT400 (Level - High)

**Trace Subcode:**

DT400 Read

Table 151. Trace record 9F73 - DBFDT400 read

| Offset | Type    | Length | Description  |
|--------|---------|--------|--------------|
| 0      | Address | 4      | Address IOTI |
| 4      | Address | 4      | Address DMHR |
| 8      | Fixed   | 4      | DMHRSRBA     |
| 12     | Address | 4      | DMHRDMAC     |

Table 151. Trace record 9F73 - DBFDT400 read (continued)

| Offset | Type    | Length | Description    |
|--------|---------|--------|----------------|
| 16     | Fixed   | 4      | IOTIERQE Count |
| 20     | Address | 4      | IOTIEMAC       |

**Example:**

|            |          |                       |                       |                           |
|------------|----------|-----------------------|-----------------------|---------------------------|
| DT400 Read | 9F7374E5 | IOTI<br> <br>02F553A0 | DMHR<br> <br>0316A860 | DMHRSRBA<br> <br>00014000 |
|            | 028F7E28 | 00000002              | 02867040              | 8FA4571B                  |
|            | <br>DMAC | <br>IOTIERQE          | <br>EMAC<br>count     |                           |

**9F74**

**Module:**

DBFDT400 Write

**Explanation:**

Record cut at Write in DBFDT400 (Level - High)

**Trace Subcode:**

DT400 Write

Table 152. Trace record 9F74 - DBFDT400 write

| Offset | Type    | Length | Description  |
|--------|---------|--------|--------------|
| 0      | Address | 4      | Address IOTI |
| 4      | Address | 4      | Address DMHR |
| 8      | Fixed   | 4      | DMHRSRBA     |
| 12     | Address | 4      | DMHRDMAC     |
| 16     | Address | 4      | IOTIEMAC     |

**Example:**

|             |          |                       |                       |                           |
|-------------|----------|-----------------------|-----------------------|---------------------------|
| DT400 Write | 9F7474DC | IOTI<br> <br>02F553A0 | DMHR<br> <br>0316AD38 | DMHRSRBA<br> <br>00013000 |
|             | 028F7E28 | 02867040              | 00000000              | 8FA06CE5                  |
|             | <br>DMAC | <br>EMAC              |                       |                           |

**Related reference**

[“IMS type-1 trace function codes” on page 624](#)



You use trace function codes to help you diagnose performance problems or other problems with IMS.

## X'D4': database tracker trace entries (D4)

The following table shows the database tracking trace entries for the X'D4' trace entry.

Table 153. Database tracking trace entries for X'D4' trace entry

| Word 1, first half                   | Word 1, second half                          | Word 2    | Word 3    | Word 4      | Word 5                                     | Word 6                                            | Word 7 |
|--------------------------------------|----------------------------------------------|-----------|-----------|-------------|--------------------------------------------|---------------------------------------------------|--------|
| X'0001': DRQE queued on DRWQ         | Stream ID                                    | TDBC      | DRQE      | DRWQ        | Log sequence number (LSN), right half only | Prilog start time. In the format: yyyydddFhhmsstt |        |
| X'0002': DRQE queued on TDBC         | Stream ID                                    | TDBC      | DRQE      | DRWQ        | Log sequence number (LSN), right half only | Prilog start time. Format: yyyydddFhhmsstt        |        |
| X'0003': DRQE freed without tracking | Stream ID                                    | TDBC      | DRQE      |             | Log sequence number (LSN), right half only | Prilog start time. Format: yyyydddFhhmsstt        |        |
| X'0004': DBTI                        | X'0001': Dispatched for work                 | PST       | DTT       | DTTPCTL     |                                            |                                                   |        |
| X'0005': DFSDT240 AWE                | AWE function <a href="#">"1"</a> on page 469 | TDBC      | AWE       |             |                                            |                                                   |        |
| X'0006': DFSDT300 AWE                | AWE function <a href="#">"2"</a> on page 469 | TDBC      | AWE       | Return code |                                            |                                                   |        |
| X'0007': Shutdown                    | X'0030': DFSDT300                            |           |           |             |                                            |                                                   |        |
|                                      | X'0040': DFSDT400                            | PST       | DTT       |             |                                            |                                                   |        |
|                                      | X'0050': DFSDT500                            | PST       |           |             |                                            |                                                   |        |
| X'0008': DB stop                     | Function <a href="#">"3"</a> on page 469     | Reason    | TDBC      | ECB         |                                            |                                                   |        |
| X'0009': Milestone                   | X'0000': Prepare for milestone               | Type code | New index |             |                                            |                                                   |        |
|                                      | X'0001': Begin milestone                     | Type code | New index |             |                                            |                                                   |        |

Table 153. Database tracking trace entries for X'D4' trace entry (continued)

| Word 1, first half                          | Word 1, second half                            | Word 2               | Word 3             | Word 4                      | Word 5                                  | Word 6                                      | Word 7 |
|---------------------------------------------|------------------------------------------------|----------------------|--------------------|-----------------------------|-----------------------------------------|---------------------------------------------|--------|
|                                             | X'0002': End milestone                         | Type code            |                    |                             |                                         |                                             |        |
|                                             | X'0003': BQEL transfer done                    | PST                  | PSTFNCT N          | Milestone index transferred |                                         |                                             |        |
|                                             | X'0004': Buffer purge done                     | PST                  | PSTFNCT N          | Milestone index purged      |                                         |                                             |        |
| X'0010': Record already hardened            | Stream ID                                      | TDBC                 | Hardened STCK time |                             | Right half of log sequence number (LSN) | Prilog start time. Format: yyyydddFhhmmsstt |        |
| X'000A': End stream                         | Stream type                                    | Stream id            | Milestone index    |                             |                                         |                                             |        |
| X'000B': Load balance                       | X'0000': DTT statistics                        | DTT                  | Busy percent       | DTTWAIT                     | DTTWORK                                 | DTTPCTL                                     |        |
|                                             | X'0001': Summary                               | Average busy percent | Active DBTIs       | Backlog                     |                                         |                                             |        |
|                                             | X'0002': DRWQ assign                           | New DTT              | DRWQ               | Q busy percent              | Old DTT                                 |                                             |        |
|                                             | X'0003': DRWQ assigns complete                 | Old DTT              |                    |                             |                                         |                                             |        |
| X'000C': OFR                                | X'0000': DFSLROFR called                       | OFR id               | OFRL               | DB count                    |                                         |                                             |        |
|                                             | X'0001': Restart OFR                           | OFR id               | TDBC               | TDBCT                       | Flags                                   |                                             |        |
|                                             | X'0002': Begin OFR                             | OFR id               | TDBC               | TDBCT                       | Flags                                   |                                             |        |
|                                             | X'0003': End OFR                               | OFR id               | TDBC               | TDBCT                       | Flags                                   |                                             |        |
|                                             | X'0004': Begin OFR ignored                     | OFR id               | TDBC               | TDBCT                       | Flags                                   |                                             |        |
|                                             | X'0005': Restart OFR ignored                   | OFR id               | TDBC               | TDBCT                       | Flags                                   |                                             |        |
| X'000F': Wait/post/resume for routed record | Event <sup>4</sup> on <a href="#">page 470</a> | TDBC                 | ECB                |                             |                                         |                                             |        |

Notes to [Table 153 on page 467](#):

1. AWE functions for DFSDT240 (trace code X'0005'):

**X'0015'**

Open/authorize/NUSID for database succeeded

**X'0017'**

Stream does not apply (open/authorize/NUSID failed)

**X'0018'**

Process TDBC queue

**X'001A'**

Add DDIR through online change

**X'001E'**

Database might need OFR

**X'0020'**

OLR output data set creation succeeded

**X'0021'**

OLR output data set creation failed

2. AWE functions for DFSDT300 (trace code X'0006'):

**X'0001'**

Initialize DLI/SAS queue server

**X'0002'**

Terminate DLI/SAS queue server

**X'0003'**

Open/authorize/NUSID for database

**X'0004'**

Close database

**X'0005'**

End database tracking, written to disk

**X'0006'**

End database tracking, initial call

**X'0007'**

Stream complete, initial call

**X'0008'**

Stream complete, written to disk

**X'0009'**

Load balancing

**X'000A'**

OFR needed

**X'000B'**

OFR complete, initial call

**X'0010'**

OFR complete, written to disk

**X'001F'**

Create OLR output data sets

**X'0020'**

OLR cursor active, written to disk

**X'0021'**

OLR cursor inactive

3. Functions for DFSDT180, database stop (trace code X'0008'):

**X'0000'**

Initiate database stop

**X'0001'**

Database stop complete

**X'0002'**

Database might need OFR

**X'0003'**

Log the TDBC state

**X'0004'**

Call DFSLRETR to record tracking suspend point

**X'0005'**

Database started

## 4. Events for wait/post/resume for routed record (X'000F'):

**X'0000'**

Wait because of OFR-pending.

**X'0001'**

Posted because database is up to date already; OFR not needed.

**X'0002'**

Posted because OFR was started.

**X'0003'**

Posted because stop is complete.

**X'0004'**

Posted at end-OFR (should not occur).

**X'0005'**

Posted because database is up to date at restart (should not occur).

**X'0006'**

Posted for unknown reason when starting database (should not occur).

**X'0007'**

Posted because of error starting OFR.

**X'0008'**

Posted because the log router reported an exceptional condition that prevented OFR from starting.

**X'0009'**

Resumption after being posted.

**Related concepts**[“DL/I trace” on page 161](#)

The DL/I trace table is a combined trace consisting of entries from DL/I calls, the DL/I buffer handler, DL/I OPEN/CLOSE, HD space management, lock activity (using PI or IRLM), OSAM, DFP interface, HALDB OLR trace, and ABENDU0427.

## Buffer handler trace entries at the database tracker

---

Trace entries are written for buffer handler calls at the database tracker just as they are at the active site.

These entries are described in [“X'DB' through X'FA' trace entry” on page 194](#). However, there are differences in these trace entries when they are written by the database tracker:

- Word 3 contains the RBA or RBN of the data in the CI or block rather than PSTDSGA.
- Word 6 contains the right half of the log sequence number (LSN) rather than PSTISAMW.

## Log router trace data

The log router (LRTT) trace entries are documented in Trace record 3701 - data set services control routine entry through Trace record 3788 - create active stream begin takeover. Field lengths are in bytes.

### 3701

**Module:**

DFSLRDSS Data Set Services Control ITASK Routine

**Explanation:**

Record cut at entry to DFSLRDSS (Level - Low)

**Trace Subcode:**

LRDSS Entry

Table 154. Trace record 3701 - data set services control routine entry

| Offset | Type                                                                                                                                    | Length | Description                                                                                                                                                                                                                                        |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4      | Fixed                                                                                                                                   | 1      | AWLGFUNC (AWE Function)                                                                                                                                                                                                                            |
| 5      | Fixed                                                                                                                                   | 1      | AWLGDSFL (DSS Request Code)                                                                                                                                                                                                                        |
| 6      | Fixed                                                                                                                                   | 1      | AWLGDSTP (Data Set Type)                                                                                                                                                                                                                           |
|        | 1... ....<br>.1.. ....<br>.1. ....<br>...1 1111                                                                                         | 1      | Tracking_SLDS (AWLGDTRK)<br>Archive SLDS (AWLGDARC)<br>Archive RLDS (AWLGDRLD)                                                                                                                                                                     |
| 7      | Fixed                                                                                                                                   | 1      | Request Priority (AWLGDPRI)                                                                                                                                                                                                                        |
| 8      | Address                                                                                                                                 | 4      | LTDCB address (AWLGDLTDCB)                                                                                                                                                                                                                         |
| 12     | Address                                                                                                                                 | 4      | LDS address (AWLGDLD)                                                                                                                                                                                                                              |
| 16     | Bit                                                                                                                                     | 4      | DSS Flags (LGBDSSFLAGS)                                                                                                                                                                                                                            |
|        | 1... ....<br>.1.. ....<br>..1. ....<br>...1 ....<br>... 1...<br>... .1..<br>... ..1.<br>... ...1<br>1... ....<br>.1.. ....<br>..11 1111 | 1      | LGB_CBTE_ALTERED<br>LGBDSS_DUAL_TRACKING_SLDS<br>LGBDSS_DUAL_ARCHIVE_SLDS<br>LGBDSS_DUAL_ARCHIVE_RLDS<br>LGB_ARCHIVE_SLDS<br>LGB_ARCHIVE_RLDS<br>LGB_INITIALIZEDSS<br>LGB_TERMINATINGDSS<br>LGB_DSS_DATASETS_RETURNED<br>LGB_DSS_RESTART_INIT<br>* |
| 20     | Fixed                                                                                                                                   | 4      | LGB_DATASET_NUMBER                                                                                                                                                                                                                                 |
| 24     | Bit                                                                                                                                     | 2      | Data set Action Flags (AWLGDSAC)                                                                                                                                                                                                                   |

Table 154. Trace record 3701 - data set services control routine entry (continued)

| Offset | Type      | Length | Description                        |
|--------|-----------|--------|------------------------------------|
|        | 1... ..   |        | Delete data set (AWLGDSDE)         |
|        | .1.. ..   |        | Input/Output (AWLGDSIO)            |
|        | ..1. .... |        | Last active data set (AWLGDLS)     |
|        | ...1 .... |        | Allocate for restart (AWLGDARS)    |
|        | .... 1... |        | 4906 delete record (AWLGD4906)     |
|        | .... .1.. |        | Delete for restart (AWLGRST)       |
|        | .... ..1. |        | End stream notification (AWLGDEST) |
|        | .... ...1 |        | Create prealloc data set (AWLGDLS) |
| 25     | Bit       | 2      | LTDCB_FLAGS                        |
|        | 1... ..   |        | LTDCB_DBRC_OPEN                    |
|        | .1.. ..   |        | LTDCB_DBRC_CLOSED                  |
|        | ..1. .... |        | LTDCB_LAST_BUFFER_WRITTEN          |
|        | ...1 .... |        | LTDCB_EODAD                        |
|        | .... 1... |        | LTDCB_DELETE_DATASET               |
|        | .... .1.. |        | LTDCB_OPEN_ERROR_1                 |
|        | .... ..1. |        | LTDCB_OPEN_ERROR_2                 |
|        | .... ...1 |        | LTDCB_MOUNTABLE                    |

### 3702

**Module:**

DFSLRDCR Data Set Create Routine

**Explanation:**

Invoke DYA from DFSLRDCR (Level - Medium)

**Trace Subcode:**

LRDCR Create

Table 155. Trace record 3702 - create data set routine invoke DYA

| Offset | Type      | Length | Description            |
|--------|-----------|--------|------------------------|
| 4      | Character | 8      | DD Name (LTDCB_DDNAME) |
| 12     | Character | 8      | DS Type (from DS Name) |
| 20     | Character | 8      | DS Name (LTDCB_DSN)    |
| 28     | Address   | 4      | LDSD address (AWLGDLS) |

### 3703

**Module:**

DFSLRDCR Data Set Create Routine

**Explanation:**

Record cut at exit from DFSLRDCR (Level - Medium)

**Trace Subcode:**

LRDCR Exit

Table 156. Trace record 3703 - create data set routine exit

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
| 4      | Fixed     | 1      | AWLGFUNC (AWE Function)       |
| 5      | Fixed     | 1      | AWLGDSFL (DSS Request Code)   |
| 6      | Fixed     | 1      | AWLGDSTP (Data Set Type)      |
|        | 1... ..   |        | Tracking_SLDS (AWLGDTRK)      |
|        | .1.. ..   |        | Archive SLDS (AWLGDARC)       |
|        | ..1. .... |        | Archive RLDS (AWLGDRLD)       |
|        | ...1 1111 |        |                               |
| 7      | Fixed     | 1      | Request Priority (AWLGDPRI)   |
| 8      | Fixed     | 4      | Return Code                   |
| 12     | Fixed     | 2      | Return Code from Data Set One |
| 14     | Fixed     | 2      | Reason Code from Data Set One |
| 16     | Fixed     | 2      | Return Code from Data Set Two |
| 18     | Fixed     | 2      | Reason Code from Data Set Two |
| 20     | Address   | 4      | LTDCB address (AWLGDLTLD)     |
| 24     | Address   | 4      | LDS address (AWLGDLD)         |

### 3704

**Module:**

DFSLRDAL Data Set Allocate Routine

**Explanation:**

Record cut at exit from DFSLRDAL (Level - Medium)

**Trace Subcode:**

LRDAL Exit

Table 157. Trace record 3704 - allocate data set routine exit

| Offset | Type    | Length | Description                   |
|--------|---------|--------|-------------------------------|
| 4      | Fixed   | 4      | Return Code                   |
| 8      | Fixed   | 2      | Return Code from Data Set One |
| 10     | Fixed   | 2      | Reason Code from Data Set One |
| 12     | Fixed   | 2      | Return Code from Data Set Two |
| 14     | Fixed   | 2      | Reason Code from Data Set Two |
| 16     | Address | 4      | LTDCB Address (AWLGDLTLD)     |
| 20     | Address | 4      | LDS address (AWLGDLD)         |
| 24     | Address | 4      | R13                           |

### 3705

**Module:**

DFSLRDOP Data Set Open Routine

**Explanation:**

Record cut at exit from DFSLRDOP (Level - Medium)

**Trace Subcode:**

LRDOP Exit

*Table 158. Trace record 3705 - open data set routine exit*

| Offset | Type      | Length | Description                                  |
|--------|-----------|--------|----------------------------------------------|
| 4      | Fixed     | 1      | AWLGDSFL (DSS Request Code)                  |
| 5      | Bit       | 1      | Data set Action Flags (AWLGDSAC)             |
|        | 1... .... |        | Delete data set (AWLGDSDE)                   |
|        | .1.. .... |        | Input/Output (AWLGDSIO)                      |
|        | ..1. .... |        | Last active data set (AWLGDLSST)             |
|        | ...1 .... |        | Allocate for restart (AWLGDARS)              |
|        | .... 1... |        | 4906 delete record (AWLGD4906)               |
|        | .... .1.. |        | Delete for restart (AWLGDIRST)               |
|        | .... ..1. |        | End stream notification (AWLGDEST)           |
|        | .... ...1 |        | Create prealloc data set (AWLGDIGB)          |
| 6      | Fixed     | 2      | Reason Code from Open Routine                |
| 8      | Fixed     | 2      | Return Code from Open Macro for Data Set One |
| 10     | Fixed     | 2      | Return Code from Open Macro for Data Set Two |
| 12     | Address   | 3      | LTDCB address (AWLGDITD)                     |
| 16     | Address   | 4      | LDS address (AWLGDIDS)                       |
| 20     | Address   | 4      | AWE address                                  |
| 24     | Address   | 4      | R13                                          |

**3707****Module:**

DFSLRDDE Data Set Deallocate/Delete Routine

**Explanation:**

Record cut at exit from DFSLRDDE (Level - Medium)

**Trace Subcode:**

LRDDE Exit

*Table 159. Trace record 3707 - deallocate/delete data set routine exit*

| Offset | Type      | Length | Description                 |
|--------|-----------|--------|-----------------------------|
| 4      | Fixed     | 1      | AWLGFUNC (AWE Function)     |
| 5      | Fixed     | 1      | AWLGDSFL (DSS Request Code) |
| 6      | Fixed     | 1      | AWLGDSTP (Data Set Type)    |
|        | 1... .... |        | Tracking_SLDS (AWLGDTRK)    |
|        | .1.. .... |        | Archive SLDS (AWLGDARC)     |
|        | ..1. .... |        | Archive RLDS (AWLGDRLD)     |
|        | ...1 1111 |        |                             |
| 7      | Fixed     | 1      | Request Priority (AWLGDPRI) |



Table 159. Trace record 3707 - deallocate/delete data set routine exit (continued)

| Offset | Type      | Length | Description                         |
|--------|-----------|--------|-------------------------------------|
| 8      | Address   | 4      | LTDCB address (AWLGDLTD)            |
| 12     | Address   | 4      | LDSD address (AWGLDLDS)             |
| 16     | Fixed     | 2      | Return Code from Data Set One       |
| 18     | Fixed     | 2      | Reason Code from Data Set One       |
| 20     | Fixed     | 2      | Return Code from Data Set Two       |
| 22     | Fixed     | 2      | Reason Code from Data Set Two       |
| 24     | Bit       | 1      | Data set Action Flags (AWLGDSAC)    |
|        | 1... ..   |        | Delete data set (AWLGDSDE)          |
|        | .1.. ..   |        | Input/Output (AWLGDSIO)             |
|        | ..1. .... |        | Last active data set (AWGLDLST)     |
|        | ...1 .... |        | Allocate for restart (AWLGDARS)     |
|        | .... 1... |        | 4906 delete record (AWLGD4906)      |
|        | .... .1.. |        | Delete for restart (AWLGDRST)       |
|        | .... ..1. |        | End stream notification (AWLGDEST)  |
|        | .... ...1 |        | Create prealloc data set (AWGLDLGB) |
| 25     | Bit       | 2      | LTDCB_flags                         |
|        | 1... ..   |        | LTDCB_DBRC_OPEN                     |
|        | .1.. ..   |        | LTDCB_DBRC_CLOSED                   |
|        | ..1. .... |        | LTDCB_LAST_BUFFER_WRITTEN           |
|        | ...1 .... |        | LTDCB_EODAD                         |
|        | .... 1... |        | LTDCB_DELETE_DATASET                |
|        | .... .1.. |        | LTDCB_OPEN_ERROR_1                  |
|        | .... ..1. |        | LTDCB_OPEN_ERROR_2                  |
|        | .... ...1 |        | LTDCB_MOUNTABLE                     |

**Module:**

DFSLRMRG Log Router Log Merge

**Explanation:**

Record is cut when a stream is removed from a merge (Level - Low)

**Trace Subcode:**

LRMRG End Mrg

Table 160. Trace record 3709 - end of merge

| Offset | Type      | Length | Description                      |
|--------|-----------|--------|----------------------------------|
| 4      | Character | 8      | Stream subsystem ID              |
| 12     | Character | 1      | mrbs_status                      |
| 13     | Character | 1      | Spare                            |
| 14     | Fixed     | 2      | Number of remaining merge blocks |
| 16     | Fixed     | 4      | Stream ID                        |
| 20     | Character | 4      | stb_last_routed_LSN(5-8)         |

**370E****Module:**

DFSLRRRO Log Record Router

**Explanation:**

Record cut at End Buffer (Level - Low)

**Trace Subcode:**

LRRRO End Strm

*Table 161. Trace record 370E - received last buffer of the active stream*

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 4      | Fixed     | 4      | stb_routing_prilog_token |
| 8      | Character | 8      | stb_last_routed_LSN      |
| 2      | Bit       | 16     | stb_flags                |
|        | 1... .... |        | STB_DATASHARING          |
|        | .1.. .... |        | STB_TERMINATED           |
|        | ..1. .... |        | STB_BATCH                |
|        | ...1 .... |        | STB_OFR_CACHING          |
|        | .... 1... |        | STB_TERMINATING          |
|        | .... .1.. |        | STB_CONV_WITH_LOGGER     |
|        | .... ..1. |        | STB_ACTIVE_ABENDED       |
|        | .... ...1 |        | STB_SHUTDOWN_IN_PROGRESS |
|        | 1... .... |        | STB_RESTARTING           |
|        | .1.. .... |        | STB_READ_IN_PROGRESS     |
|        | ..1. .... |        | STB_READ_ERROR           |
|        | ...1 .... |        | STB_ROUTING_SUSPENDED    |
|        | .... 1... |        | STB_END_OF_STREAM        |
|        | .... .1.. |        | STB_UNABLE_TO_ROUTE      |
|        | .... ..1. |        | STB_SHUTDOWN_REQUESTED   |
|        | .... ...1 |        | STB_SHUTDOWN_COMPLETE    |
| 18     | Bit       | 2      | LRB_BUFFER_flags         |
|        | 1... .... |        | LRB_BUFFER_DS_FULL       |
|        | 1... .... |        | LRB_BUFFER_EODAD         |
|        | .1.. .... |        | STB_BUFFER_IO_ABEND      |
|        | ..11 1111 |        | *                        |
|        | 1... .... |        | LRB_READ_COMPLETE        |
|        | .1.. .... |        | LRB_BUFFER_LAST          |
|        | ..1. .... |        | LRB_BUFFER_ENDDS         |
|        | ...1 .... |        | LRB_BUFFER_RESTART       |
|        | .... 11.. |        | LRB_BUFFER_ORIGIN        |
|        | 00        |        | LRB_FROM_LOGGER          |
|        | 01        |        | LRB_FROM_ILS             |
|        | 10        |        | LRB_FROM_READER          |
|        | 11        |        | LRB_FROM_ARCH            |
|        | .... ..1. |        | LRB_ACTIVE_ABEND         |
|        | .... ...1 |        | LRB_BEGIN_OFR_CACHING    |
| 20     | Fixed     | 4      | stb_streamID             |

Table 161. Trace record 370E - received last buffer of the active stream (continued)

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 24     | Character | 4      | stb_routing_prilog_token |
| 28     | Fixed     | 2      | lpd_feedback             |

### 370F

**Module:**

DFSLRRBF Route Buffer Routine

**Explanation:**

Record cut at exit from DFSLRRBF (Level - High)

**Trace Subcode:**

LRRBF Route

Table 162. Trace record 370F - routed log records from buffer to trackers

| Offset | Type      | Length | Description                |
|--------|-----------|--------|----------------------------|
| 4      | Character | 4      | lrb_record_id(5-8)         |
| 8      | Character | 4      | First routed LSN           |
| 12     | Character | 4      | Last routed LSN            |
| 16     | Fixed     | 4      | offset to first LSN routed |
| 20     | Fixed     | 4      | lpd_stream_type            |
| 24     | Fixed     | 4      | lpd_stream_id              |
| 28     | Address   | 4      | R13 value                  |

### 3710

**Module:**

DFSLRAST Active Stream Tracker Routine

**Explanation:**

Record cut at received 0401 log (Level - Low)

**Trace Subcode:**

LRAST PTKO Req

Table 163. Trace record 3710 - active stream tracker RSR04\_PTKO

| Offset | Type      | Length | Description            |
|--------|-----------|--------|------------------------|
| 4      | Character | 1      | rsr04code              |
| 5      | Character | 1      | rsr04sub               |
| 7      | Character | 1      | lpd_flags              |
|        | 1... .... |        | stream is being merged |
| 8      | Character | 4      | lpd_feedback           |
| 12     | Character | 4      | lrb_record_ID(5-8)     |
| 16     | Character | 8      | r04_stck               |
| 24     | Fixed     | 4      | lpd_stream_id          |

**3712****Module:**

DFSLRAST Active Stream Tracker Routine

**Explanation:**

Record cut at received 0402 through 0407 log (Level - Low)

**Trace Subcode:**

LRAST DataShr

*Table 164. Trace record 3712 - active stream tracker RSR04SUB*

| Offset | Type      | Length | Description        |
|--------|-----------|--------|--------------------|
| 4      | Character | 1      | rsr04code          |
| 5      | Character | 1      | rsr04sub           |
| 8      | Character | 4      | r04_hipritoken     |
| 12     | Character | 4      | lrb_record_ID(5-8) |
| 16     | Character | 8      | r04_prilgts(1-8)   |
| 24     | Fixed     | 31     | lpd_stream_id      |

**3731****Module:**

DFSLRSAR Stream Archiver Controller ITASK Routine

**Explanation:**

Record cut on entry to DFSLRSAR for all requests except for write (awlgfwr) and return buffer from reader during truncation (awlgfrtb) (Level - High)

**Trace Subcode:**

LRSAR Entry

*Table 165. Trace record 3731 - stream archiver controller entry*

| Offset | Type      | Length | Description                |
|--------|-----------|--------|----------------------------|
| 4      | Address   | 4      | SAA Address                |
| 8      | Bit       | 4      | SAA_flags                  |
|        | 1... .... |        | SAA_NEW_STREAM             |
|        | .1. ....  |        | SAA_LAST_BUFFER_WRITTEN    |
|        | ..1. .... |        | SAA_ARCHIVER_WAITING       |
|        | ...1 .... |        | SAA_DUAL_LOGGING           |
|        | .... 1... |        | SAA_SETUPFORARCHIVE        |
|        | .... .1.. |        | SAA_CLOSE_FAILED (to DBRC) |
|        | .... ..1. |        | SAA_SHUTDOWN               |
|        | .... ...1 |        | SAA_IS_ACTIVE              |

Table 165. Trace record 3731 - stream archiver controller entry (continued)

| Offset | Type      | Length | Description             |
|--------|-----------|--------|-------------------------|
|        | 1... .... |        | SAA_WAIT_FOR_ALL_ITASKS |
|        | .1.. .... |        | SAA_BEGIN_OFR_CACHING   |
|        | .1.. .... |        | SAA_WRITE_IN_PROGRESS   |
|        | ...1 .... |        |                         |
|        | .... 1... |        | SAA_CREATEDITASKS       |
|        | .... .1.. |        | SAA_NO_WRITE_DONE       |
|        | .... ..1. |        | *                       |
|        | .... ...1 |        | SAA_TERM_MSG_SENT       |
|        |           |        | *                       |
|        | 1... .... |        | SAA_BAD_BUFFER_DETECTED |
|        | .1.. .... |        | SAA_TERMINATING         |
|        | .1.. .... |        | SAA_ERROR_DETECTED      |
|        | ...1 .... |        | SAA_EXIT_NO_BUFFER      |
|        | .... 1... |        | SAA_DO_NOT_ROUTE        |
|        | .... .1.. |        | SAA_TRACKS_MATCH        |
|        | .... ..1. |        | SAA_HANDLE_IO_ERROR     |
|        | .... ...1 |        | SAA_GAP_FILLED          |
|        | 1... .... |        | SAA_COLDSTART           |
|        | .1.. .... |        | SAA_NOBMP               |
|        | .1.. .... |        | SAA_XRF_TAKEOVER        |
|        | ...1 .... |        | SAA_1ST_BFR_CHK_INPROG  |
|        | .... 1... |        | SAA_1ST_BUFR_CHK_OK     |
|        | .... .111 |        |                         |
| 12     | Bit       | 2      | AWLGFUNC                |
| 14     | Bit       | 1      | SAA_ITASK_CONTROL_flags |
|        | .1.. .... |        | SAA_DS_FULL             |
|        | .1.. .... |        | *                       |
|        | .1.. .... |        | SAA_IO_ERROR_1          |
|        | ...1 .... |        | SAA_IO_ERROR_2          |
|        | .... 1111 |        | *                       |
| 15     | Bit       | 1      | SAA_DS_type             |
|        | .1.. .... |        | SAA_TRACKING_SLDS       |
|        | .1.. .... |        | SAA_ARCHIVE_SLDS        |
|        | .1.. .... |        | SAA_ARCHIVE_RLDS        |
|        | ...1 1111 |        | *                       |
| 16     | Bit       | 2      | SAA_NUM_ITASKS          |
| 18     | Bit       | 2      | SAA_LOG_COPIES          |
| 20     | Bit       | 2      | SAA_AVAIL_ITASK         |
| 22     | Bit       | 2      | SAA_OLDEST_BUSY_ITASK   |
| 24     | Character | 8      | SAA_PRILOG_TIME         |

### 3732

**Module:**

DFSLRSAR Stream Archiver Controller ITASK Routine

**Explanation:**

Record cut on exit from DFSLRSAR (Level - Medium)

**Trace Subcode:**

LRSAR Exit

Table 166. Trace record 3732 - stream archiver controller exit

| Offset | Type      | Length | Description                |
|--------|-----------|--------|----------------------------|
| 4      | Address   | 4      | SAA Address                |
| 8      | Bit       | 4      | SAA_flags                  |
|        | 1... .... |        | SAA_NEW_STREAM             |
|        | .1. ....  |        | SAA_LAST_BUFFER_WRITTEN    |
|        | .1. ....  |        | SAA_ARCHIVER_WAITING       |
|        | ...1 .... |        | SAA_DUAL_LOGGING           |
|        | .... 1... |        | SAA_SETUPFORARCHIVE        |
|        | .... .1.. |        | SAA_CLOSE_FAILED (to DBRC) |
|        | .... ..1. |        | SAA_SHUTDOWN               |
|        | .... ...1 |        | SAA_IS_ACTIVE              |
|        | 1... .... |        | SAA_WAIT_FOR_ALL_ITASKS    |
|        | .1. ....  |        | SAA_BEGIN_OFR_CACHING      |
|        | .1. ....  |        | SAA_WRITE_IN_PROGRESS      |
|        | ...1 .... |        | SAA_CREATEDITASKS          |
|        | .... 1... |        | SAA_NO_WRITE_DONE          |
|        | .... .1.. |        | *                          |
|        | .... ..1. |        | SAA_TERM_MSG_SENT          |
|        | .... ...1 |        | *                          |
|        | 1... .... |        | SAA_BAD_BUFFER_DETECTED    |
|        | .1. ....  |        | SAA_TERMINATING            |
|        | .1. ....  |        | SAA_ERROR_DETECTED         |
|        | ...1 .... |        | SAA_EXIT_NO_BUFFER         |
|        | .... 1... |        | SAA_DO_NOT_ROUTE           |
|        | .... .1.. |        | SAA_TRACKS_MATCH           |
|        | .... ..1. |        | SAA_HANDLE_IO_ERROR        |
|        | .... ...1 |        | SAA_GAP_FILLED             |
|        | 1... .... |        | SAA_COLDSTART              |
|        | .1. ....  |        | SAA_NOBMP                  |
|        | .1. ....  |        | SAA_XRF_TAKEOVER           |
|        | ...1 .... |        | SAA_1ST_BFR_CK_INPROG      |
|        | .... 1... |        | SAA_1ST_BUFR_CK_OK         |
|        | .... .111 |        |                            |
| 12     | Bit       | 2      | AWLGFUNC                   |
| 14     | Bit       | 2      | SAA_ITASK_CONTROL_flags    |

Table 166. Trace record 3732 - stream archiver controller exit (continued)

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
|        | .1.. .... |        | SAA_DS_FULL           |
|        | .1.. .... |        | *                     |
|        | ..1. .... |        | SAA_IO_ERROR_1        |
|        | ...1 .... |        | SAA_IO_ERROR_2        |
|        | .... 1111 |        | *                     |
| 15     | Bit       | 1      | SAA_DS_type           |
|        | .1.. .... |        | SAA_TRACKING_SLDS     |
|        | .1.. .... |        | SAA_ARCHIVE_SLDS      |
|        | ..1. .... |        | SAA_ARCHIVE_RLDS      |
|        | ...1 1111 |        | *                     |
| 16     | Fixed     | 4      | Feedback Code         |
| 18     | Bit       | 2      | SAA_AVAIL_ITASK       |
| 20     | Bit       | 2      | SAA_OLDEST_BUSY_ITASK |
| 24     | Character | 8      | SAA_PRILOG_TIME       |

**3733**

**Module:**

DFSLRWRT Stream Archiver WRITE Routine

**Explanation:**

Record cut just prior to invocation of the WRITE macro in DFSLRWRT (Level - High)

**Trace Subcode:**

LRWRT Write

Table 167. Trace record 3733 - stream archiver WRITE invocation

| Offset | Type    | Length | Description                                                            |
|--------|---------|--------|------------------------------------------------------------------------|
| 4      | Address | 4      | SAA Address                                                            |
| 8      | Address | 4      | SAA_CURRENT_DATA_WRITTEN                                               |
| 12     | Address | 4      | LTDCB_DCB_PTR(*)                                                       |
| 16     | Address | 4      | SAA_ITASK_BUFFER(*)                                                    |
| 20     | Fixed   | 4      | LRB_BUFFER_HARD last 4 bytes of the last committed log sequence number |
| 24     | Fixed   | 4      | LRB_RECORD_ID                                                          |
| 28     | Fixed   | 4      | LRB_BUFFER_LLSN number in buffer being written (lower half word)       |

**3734**

**Module:**

DFSLRSDS Stream Archiver Switch Data Set Routine

**Explanation:**

Record cut just prior to switching data sets when a data set full or other error condition is recognized (Level - High)

**Trace Subcode:**  
LRSDS Switch

Table 168. Trace record 3734 - stream archiver switch data set

| Offset | Type      | Length | Description                |
|--------|-----------|--------|----------------------------|
| 4      | Address   | 4      | SAA address                |
| 8      | Bit       | 4      | SAA_flags                  |
|        | 1... .... |        | SAA_NEW_STREAM             |
|        | .1.. .... |        | SAA_LAST_BUFFER_WRITTEN    |
|        | ..1. .... |        | SAA_ARCHIVER_WAITING       |
|        | ...1 .... |        | SAA_DUAL_LOGGING           |
|        | .... 1... |        | SAA_SETUPFORARCHIVE        |
|        | .... .1.. |        | SAA_CLOSE_FAILED (to DBRC) |
|        | .... ..1. |        | SAA_SHUTDOWN               |
|        | .... ...1 |        | SAA_IS_ACTIVE              |
|        | 1... .... |        | SAA_WAIT_FOR_ALL_ITASKS    |
|        | .1.. .... |        | SAA_BEGIN_OFR_CACHING      |
|        | ..1. .... |        | SAA_WRITE_IN_PROGRESS      |
|        | ...1 .... |        | SAA_CREATEDITASKS          |
|        | .... 1... |        | SAA_NO_WRITE_DONE          |
|        | .... .1.. |        | *                          |
|        | .... ..1. |        | SAA_TERM_MSG_SENT          |
|        | .... ...1 |        | *                          |
|        | 1... .... |        | SAA_BAD_BUFFER_DETECTED    |
|        | .1.. .... |        | SAA_TERMINATING            |
|        | ..1. .... |        | SAA_ERROR_DETECTED         |
|        | ...1 .... |        | SAA_EXIT_NO_BUFFER         |
|        | .... 1... |        | SAA_DO_NOT_ROUTE           |
|        | .... .1.. |        | SAA_TRACKS_MATCH           |
|        | .... ..1. |        | SAA_HANDLE_IO_ERROR        |
|        | .... ...1 |        | SAA_GAP_FILLED             |
|        | 1... .... |        | SAA_COLDSTART              |
|        | .1.. .... |        | SAA_NOBMP                  |
|        | ..1. .... |        | SAA_XRF_TAKEOVER           |
|        | ...1 .... |        | SAA_1ST_BFR_CK_INPROG      |
|        | .... 1... |        | SAA_1ST_BUFR_CK_OK         |
|        | .... .111 |        |                            |
| 12     | Address   | 4      | SAA_LDSD                   |
| 16     | Address   | 4      | SAA_LTDCB                  |
| 20     | Character | 4      | AWLG_CSW_LSN               |
| 24     | Character | 4      | LRB_RECORD_ID              |
| 28     | Fixed     | 4      | Switch feedback            |

**3736**

**Module:**  
DFSLRLTS Log Truncation Start Routine



**Explanation:**

Record cut at exit from DFSLRLTS (Level - Low)

**Trace Subcode:**

LRLTS Exit

*Table 169. Trace record 3736 - stream archiver log truncation start exit*

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 4      | Character | 8      | SAA_TRUNC_LSN_POINT      |
| 12     | Address   | 4      | SAA Address              |
| 16     | Address   | 4      | SAA_LDSD                 |
| 20     | Character | 8      | SAA_PRILOG_TIME          |
| 28     | Bit       | 2      | SAA_TRUNC_flags          |
|        | 1... .... |        | SAA_TRUNCATION           |
|        | .1.. .... |        | SAA_TRUNC_READ_COMPLETE  |
|        | ..1. .... |        | SAA_TRUNC_WRITE_COMPLETE |
|        | ...1 .... |        | SAA_TRUNC_NO_DATASET     |
|        | .... 1... |        | SAA_TRUNC_RESTART_WRITE  |
|        | .... .1.. |        | SAA_RETRY                |
|        | .... ..1. |        | SAA_PRIOR_RDR_ERR        |
|        | .... ...1 |        | SAA_RETRY_SENT           |
|        | 1... .... |        | SAA_TRUNC_NONE_DONE      |
|        | .111 1111 |        | *                        |
| 30     | Fixed     | 16     | SAA_TRUNC_STAGE          |

**3737****Module:**

DFSLRLTR Log Truncation Routine

**Explanation:**

Record cut at exit from DFSLRLTR (Level - Low)

**Trace Subcode:**

LRLTR Exit

*Table 170. Trace record 3737 - log router log truncation exit*

| Offset | Type      | Length | Description                |
|--------|-----------|--------|----------------------------|
| 4      | Address   | 4      | SAA address                |
| 8      | Bit       | 4      | SAA_flags                  |
|        | 1... .... |        | SAA_NEW_STREAM             |
|        | .1.. .... |        | SAA_LAST_BUFFER_WRITTEN    |
|        | ..1. .... |        | SAA_ARCHIVER_WAITING       |
|        | ...1 .... |        | SAA_DUAL_LOGGING           |
|        | .... 1... |        | SAA_SETUPFORARCHIVE        |
|        | .... .1.. |        | SAA_CLOSE_FAILED (to DBRC) |
|        | .... ..1. |        | SAA_SHUTDOWN               |
|        | .... ...1 |        | SAA_IS_ACTIVE              |

Table 170. Trace record 3737 - log router log truncation exit (continued)

| Offset | Type                                                                                                | Length | Description                                                                                                                                                                  |
|--------|-----------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | 1... ....<br>.1.. ....<br>.1. ....<br>...1 ....<br>.... 1...<br>.... .1..<br>.... ..1.<br>.... ...1 |        | SAA_WAIT_FOR_ALL_ITASKS<br>SAA_BEGIN_OFR_CACHING<br>SAA_WRITE_IN_PROGRESS<br>SAA_CREATEDITASKS<br>SAA_NO_WRITE_DONE<br>*<br>SAA_TERM_MSG_SENT<br>*                           |
|        | 1... ....<br>.1.. ....<br>.1. ....<br>...1 ....<br>.... 1...<br>.... .1..<br>.... ..1.<br>.... ...1 |        | SAA_BAD_BUFFER_DETECTED<br>SAA_TERMINATING<br>SAA_ERROR_DETECTED<br>SAA_EXIT_NO_BUFFER<br>SAA_DO_NOT_ROUTE<br>SAA_TRACKS_MATCH<br>SAA_HANDLE_IO_ERROR<br>SAA_GAP_FILLED      |
|        | 1... ....<br>.1.. ....<br>.1. ....<br>...1 ....<br>.... 1...<br>.... .111                           |        | SAA_COLDSTART<br>SAA_NOBMP<br>SAA_XRF_TAKEOVER<br>SAA_1ST_BFR_CK_INPROG<br>SAA_1ST_BUF_CK_OK                                                                                 |
| 12     | Bit                                                                                                 | 2      | SAA_TRUNC_flags                                                                                                                                                              |
|        | 1... ....<br>.1.. ....<br>.1. ....<br>...1 ....<br>.... 1...<br>.... .1..<br>.... ..1.<br>.... ...1 |        | SAA_TRUNCATION<br>SAA_TRUNC_READ_COMPLETE<br>SAA_TRUNC_WRITE_COMPLETE<br>SAA_TRUNC_NO_DATASET<br>SAA_TRUNC_RESTART_WRITE<br>SAA_RETRY<br>SAA_PRIOR_RDR_ERR<br>SAA_RETRY_SENT |
|        | 1... ....<br>.111 1111                                                                              | 1      | SAA_TRUNC_NONE_DONE<br>*                                                                                                                                                     |
| 14     | Fixed                                                                                               | 2      | SAA_TRUNC_ID                                                                                                                                                                 |
| 16     | Bit                                                                                                 | 1      | SAA_DS_flags                                                                                                                                                                 |
|        | .1.. ....<br>.1.. ....<br>.1. ....<br>...1 1111                                                     |        | SAA_TRACKING_SLDS<br>SAA_ARCHIVE_SLDS<br>SAA_ARCHIVE_RLDS<br>*                                                                                                               |
| 18     | Bit                                                                                                 | 2      | SAA_ITASK_CONTROL_flags                                                                                                                                                      |

Table 170. Trace record 3737 - log router log truncation exit (continued)

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
|        | .1.. .... |        | SAA_DS_FULL         |
|        | .1.. .... |        | *                   |
|        | ..1. .... |        | SAA_IO_ERROR_1      |
|        | ...1 .... |        | SAA_IO_ERROR_2      |
|        | .... 1111 |        | *                   |
| 20     | Address   | 4      | SAA_LTDCB           |
| 24     | Character | 4      | SAA_TRUNC_LSN_POINT |

**3738**

**Module:**

DFSLRRDC Log Read Controller ITASK Routine

**Explanation:**

Record cut on exit from DFSLRRDC (Level - Low)

**Trace Subcode:**

LRRDC Entry

Table 171. Trace record 3738 - log router log read controller exit

| Offset | Type      | Length | Description                                                  |
|--------|-----------|--------|--------------------------------------------------------------|
| 4      | Fixed     | 1      | AWLGFUNC                                                     |
| 8      | Address   | 4      | LDSD (if func=CRD), GFR (if func=RCU), LRA (if func=TRD)     |
| 12     | Address   | 4      | LRB Buffer Chain Address or AWLG_TRD_RDR_TOKEN (if func=TRD) |
| 16     | Address   | 4      | Requester Routine Address                                    |
| 20     | Character | 4      | First LSN of read interval                                   |
| 24     | Character | 4      | Last LSN of read interval                                    |
| 28     | Address   | 4      | AWEENQER                                                     |

**373A**

**Module:**

DFSLRRDR Log Reader

**Explanation:**

Record cut upon the initial entry to a log reader (Level - Low)

**Trace Subcode:**

LRRDR 1st Read

Table 172. Trace record 373A - log router log reader first read request

| Offset | Type    | Length | Description |
|--------|---------|--------|-------------|
| 4      | Address | 4      | LRA Address |
| 8      | Bit     | 4      | LRA_flags   |

Table 172. Trace record 373A - log router log reader first read request (continued)

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
|        | 1... .... |        | LRA_LOGREADER_WAITING         |
|        | .1.. .... |        | LRA_WAIT_FOR_ALL_ITASKS       |
|        | .1.. .... |        | LRA_CURRENT_DATASET_ALLOCATED |
|        | ...1 .... |        | LRA_READ_COMPLETE             |
|        | .... 1... |        | LRA_THROTTLE_ENABLED          |
|        | .... .1.. |        | LRA_DEALLOCATE_ENABLED        |
|        | .... ..1. |        | LRA_HIT_EODAD                 |
|        | .... ...1 |        | LRA_ALLOC_DS_ERROR            |
|        | 1... .... |        | LRA_RESTART                   |
|        | .1.. .... |        | LRA_CATCHUP_RDR               |
|        | .1.. .... |        | LRA_SENT_DONE                 |
|        | ...1 .... |        | LRA_READ_STARTED              |
|        | .... 1... |        | LRA_ONE_DATASET               |
|        | .... .1.. |        | LRA_CURRENT_DUAL              |
|        | .... ..1. |        | LRA_ALLOCATED_SECOND          |
|        | .... ...1 |        | LRA_EODADHANDLER_IN_PROGRESS  |
|        | 1... .... |        | LRA_ALLOCATE_IN_PROGRESS      |
|        | .1.. .... |        | LRA_TERM_CALLER               |
|        | .1.. .... |        | LRA_CHECK_IPOST               |
|        | ...1 .... |        | LRA_IPOSTED_READER            |
|        | .... 1... |        | LRA_CLOSE_ONLY                |
|        | .... .1.. |        | LRA_CLOSE_LAST                |
|        | .... ..1. |        | LRA_BIR_PROCESSING            |
|        | .... ...1 |        | LRA_BUFFER_LAST               |
|        | 1... .... |        | LRA_CLOSE_PRIOR_DS            |
|        | .1.. .... |        | LRA_AUTOARCH                  |
|        | .1.. .... |        | LRA_DO_NOT_IPOST              |
|        | ...1 1111 |        |                               |
| 12     | Address   | 4      | LRA_LDSD_LIST                 |
| 16     | Address   | 4      | LRA_LRB_PTR                   |
| 20     | Address   | 4      | LRA_FIRST_LSN interval        |
| 24     | Address   | 4      | LRA_LAST_LSN                  |
| 28     | Address   | 4      | Feedback Code                 |

### 373B

**Module:**

DFSLRBIR Log Reader BSAM Buffer ITASK

**Explanation:**

Record cut when returning a buffer to requester (Level - Medium)

**Trace Subcode:**

LRBIR Ret Buf

Table 173. Trace record 373B - log router log reader buffer return

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
| 4      | Address   | 4      | LRA Address                   |
| 8      | Bit       | 4      | LRA_flags                     |
|        | 1... .... |        | LRA_LOGREADER_WAITING         |
|        | .1.. .... |        | LRA_WAIT_FOR_ALL_ITASKS       |
|        | ..1. .... |        | LRA_CURRENT_DATASET_ALLOCATED |
|        | ...1 .... |        | LRA_READ_COMPLETE             |
|        | .... 1... |        | LRA_THROTTLE_ENABLED          |
|        | .... .1.. |        | LRA_DEALLOCATE_ENABLED        |
|        | .... ..1. |        | LRA_HIT_EODAD                 |
|        | .... ...1 |        | LRA_ALLOC_DS_ERROR            |
|        | 1... .... |        | LRA_RESTART                   |
|        | .1.. .... |        | LRA_CATCHUP_RDR               |
|        | ..1. .... |        | LRA_SENT_DONE                 |
|        | ...1 .... |        | LRA_READ_STARTED              |
|        | .... 1... |        | LRA_ONE_DATASET               |
|        | .... .1.. |        | LRA_CURRENT_DUAL              |
|        | .... ..1. |        | LRA_ALLOCATED_SECOND          |
|        | .... ...1 |        | LRA_EODADHANDLER_IN_PROGRESS  |
|        | 1... .... |        | LRA_ALLOCATE_IN_PROGRESS      |
|        | .1.. .... |        | LRA_TERM_CALLER               |
|        | ..1. .... |        | LRA_CHECK_IPOST               |
|        | ...1 .... |        | LRA_IPOSTED_READER            |
|        | .... 1... |        | LRA_CLOSE_ONLY                |
|        | .... .1.. |        | LRA_CLOSE_LAST                |
|        | .... ..1. |        | LRA_BIR_PROCESSING            |
|        | .... ...1 |        | LRA_BUFFER_LAST               |
|        | 1... .... |        | LRA_CLOSE_PRIOR_DS            |
|        | .1.. .... |        | LRA_AUTOARCH                  |
|        | ..1. .... |        | LRA_DO_NOT_IPOST              |
|        | ...1 1111 |        |                               |
| 12     | Fixed     | 4      | LRA_USER_token                |
| 16     | Address   | 4      | LRB address                   |
| 20     | Fixed     | 2      | ITASK index                   |
| 22     | Fixed     | 2      | LRA_OLDEST_BUSY_ITASK         |
| 24     | Character | 4      | LRB_RECORD_ID                 |
| 28     | Character | 4      | LRB_BUFFER_LLSN               |

### 373C

**Module:**

DFSLRRDR Log Read Controller ITASK Routine

**Explanation:**

Record cut when an error occurred on first copy of a data set and an attempt is being made to read the dual copy (Level - Low)

**Trace Subcode:**  
LRRDR ReRead

Table 174. Trace record 373C - log router log reader reread data set request

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
| 4      | Address   | 4      | LRA Address                   |
| 8      | Bit       | 4      | LRA_flags                     |
|        | 1... .... |        | LRA_LOGREADER_WAITING         |
|        | .1.. .... |        | LRA_WAIT_FOR_ALL_ITASKS       |
|        | ..1. .... |        | LRA_CURRENT_DATASET_ALLOCATED |
|        | ...1 .... |        | LRA_READ_COMPLETE             |
|        | .... 1... |        | LRA_THROTTLE_ENABLED          |
|        | .... .1.. |        | LRA_DEALLOCATE_ENABLED        |
|        | .... ..1. |        | LRA_HIT_EODAD                 |
|        | .... ...1 |        | LRA_ALLOC_DS_ERROR            |
|        | 1... .... |        | LRA_RESTART                   |
|        | .1.. .... |        | LRA_CATCHUP_RDR               |
|        | ..1. .... |        | LRA_SENT_DONE                 |
|        | ...1 .... |        | LRA_READ_STARTED              |
|        | .... 1... |        | LRA_ONE_DATASET               |
|        | .... .1.. |        | LRA_CURRENT_DUAL              |
|        | .... ..1. |        | LRA_ALLOCATED_SECOND          |
|        | .... ...1 |        | LRA_EODADHANDLER_IN_PROGRESS  |
|        | 1... .... |        | LRA_ALLOCATE_IN_PROGRESS      |
|        | .1.. .... |        | LRA_TERM_CALLER               |
|        | ..1. .... |        | LRA_CHECK_IPOST               |
|        | ...1 .... |        | LRA_IPOSTED_READER            |
|        | .... 1... |        | LRA_CLOSE_ONLY                |
|        | .... .1.. |        | LRA_CLOSE_LAST                |
|        | .... ..1. |        | LRA_BIR_PROCESSING            |
|        | .... ...1 |        | LRA_BUFFER_LAST               |
|        | 1... .... |        | LRA_CLOSE_PRIOR_DS            |
|        | .1.. .... |        | LRA_AUTOARCH                  |
|        | ..1. .... |        | LRA_DO_NOT_IPOST              |
|        | ...1 1111 |        |                               |
| 12     | Fixed     | 4      | LRA_REREAD_ITASK              |
| 16     | Character | 8      | LRA_DS_LSN                    |
| 20     | Character | 8      | LRA_FIRST_LSN                 |
| 24     | Character | 8      | LRA_LAST_LSN                  |
| 28     | Address   | 4      | Feedback Code                 |

**373D**

**Module:**  
DFSLRRDR Log Reader

**Explanation:**  
Record cut on exit from DFSLRRDR (Level - Low)

**Trace Subcode:**  
LRRDR Exit

Table 175. Trace record 373D - log router log reader exit

| Offset | Type      | Length | Description                   |
|--------|-----------|--------|-------------------------------|
| 4      | Address   | 4      | LRA Address                   |
| 8      | Bit       | 4      | LRA flags                     |
|        | 1... .... |        | LRA_LOGREADER_WAITING         |
|        | .1.. .... |        | LRA_WAIT_FOR_ALL_ITASKS       |
|        | ..1. .... |        | LRA_CURRENT_DATASET_ALLOCATED |
|        | ...1 .... |        | LRA_READ_COMPLETE             |
|        | .... 1... |        | LRA_THROTTLE_ENABLED          |
|        | .... .1.. |        | LRA_DEALLOCATE_ENABLED        |
|        | .... ..1. |        | LRA_HIT_EODAD                 |
|        | .... ...1 |        | LRA_ALLOC_DS_ERROR            |
|        | 1... .... |        | LRA_RESTART                   |
|        | .1.. .... |        | LRA_CATCHUP_RDR               |
|        | ..1. .... |        | LRA_SENT_DONE                 |
|        | ...1 .... |        | LRA_READ_STARTED              |
|        | .... 1... |        | LRA_ONE_DATASET               |
|        | .... .1.. |        | LRA_CURRENT_DUAL              |
|        | .... ..1. |        | LRA_ALLOCATED_SECOND          |
|        | .... ...1 |        | LRA_EODADHANDLER_IN_PROGRESS  |
|        | 1... .... |        | LRA_ALLOCATE_IN_PROGRESS      |
|        | .1.. .... |        | LRA_TERM_CALLER               |
|        | ..1. .... |        | LRA_CHECK_IPOST               |
|        | ...1 .... |        | LRA_IPOSTED_READER            |
|        | .... 1... |        | LRA_CLOSE_ONLY                |
|        | .... .1.. |        | LRA_CLOSE_LAST                |
|        | .... ..1. |        | LRA_BIR_PROCESSING            |
|        | .... ...1 |        | LRA_BUFFER_LAST               |
|        | 1... .... |        | LRA_CLOSE_PRIOR_DS            |
|        | .1.. .... |        | LRA_AUTOARCH                  |
|        | ..1. .... |        | LRA_DO_NOT_IPOST              |
|        | ...1 1111 |        |                               |
| 12     | Fixed     | 2      | LRA_AVAIL_ITASK               |
| 14     | Fixed     | 2      | LRA_OLDEST_BUSY_ITASK         |
| 16     | Address   | 4      | LRA_GOOD_LSN                  |
| 20     | Address   | 4      | LRA_FIRST_LSN interval        |
| 24     | Address   | 4      | LRA_LAST_LSN                  |
| 28     | Address   | 4      | Feedback Code                 |

**373E**

**Module:**  
DFSLRRDS Start Log Reader

**Explanation:**

Record cut on entry to DFSLRRDS (Level - Low)

**Trace Subcode:**

LRRDS Entry

*Table 176. Trace record 373E - log router start log reader entry*

| Offset | Type      | Length | Description            |
|--------|-----------|--------|------------------------|
| 4      | Address   | 1      | AWE function Code      |
| 5      | Fixed     | 3      | Number of GDS          |
| 8      | Address   | 4      | LDSD or GDS address    |
| 12     | Address   | 2      | LRB chain address      |
| 16     | Address   | 4      | User's routine Address |
| 20     | Fixed     | 4      | User's token interval  |
| 24     | Character | 4      | First LSN (bytes 5:8)  |
| 28     | Character | 4      | Last LSN (bytes 5:8)   |

**3740****Module:**

DFSLRCAS Create Active Stream Routine

**Explanation:**

Record cut on create new Stream to DFSLRCAS (Level - Low)

**Trace Subcode:**

LRCAS New Strm

*Table 177. Trace record 3740 - DFSLRCAS create active stream new stream*

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 4      | Fixed     | 4      | Addr of STB block        |
| 8      | Character | 8      | Instance name            |
| 16     | Fixed     | 4      | Conversation token       |
| 20     | Fixed     | 4      | Initial Routing Position |

**3741****Module:**

DFSLRCAS Create Active Stream Allocate Conversation

**Explanation:**

Record cut on allocate conversation to exist stream (Level - Low)

**Trace Subcode:**

LRCAS All Conv

*Table 178. Trace record 3741 - DFSLRCAS create active stream allocate conversation*

| Offset | Type  | Length | Description       |
|--------|-------|--------|-------------------|
| 4      | Fixed | 4      | Addr of STB block |



Table 178. Trace record 3741 - DFSLRCAS create active stream allocate conversation (continued)

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 8      | Character | 8      | STB active Instance name |
| 16     | Fixed     | 4      | Conversation token       |
| 20     | Fixed     | 4      | Routing Position         |

**3742**

**Module:**

DFSLRCAS Create Active Stream Set Position

**Explanation:**

Record cut on set the current position (Level - Low)

**Trace Subcode:**

LRCAS Set Pos

Table 179. Trace record 3742 - DFSLRCAS create active stream set position

| Offset | Type      | Length | Description              |
|--------|-----------|--------|--------------------------|
| 4      | Fixed     | 4      | Addr of STB block        |
| 8      | Fixed     | 4      | STB routing prilog token |
| 12     | Character | 8      | STB last routed LSN      |

**374F**

**Module:**

DFSLRASC Active Stream Control Routine

**Explanation:**

Record cut on entry to DFSLRASC (Level - Medium)

**Trace Subcode:**

LRASC Entry

Table 180. Trace record 374F - DFSLRASC active stream control entry

| Offset | Type      | Length | Description          |
|--------|-----------|--------|----------------------|
| 4      | Fixed     | 1      | Entry Function       |
| 5      | Character | 3      | Spares               |
| 8      | Address   | 4      | STB Address          |
| 12     | Address   | 4      | SAA Address          |
| 16     | Address   | 4      | SRA Address          |
| 20     | Character | 8      | Active Instance Name |

**3750**

**Module:**

DFSLRORH Online Forward Recovery Request Handler

**Explanation:**

Record cut on entry to and exit from DFSLRORH (Level - Low)

**Trace Subcode:**  
LRRH Request

Table 181. Trace record 3750 - initiate online forward recovery (OFR)

| Offset | Type    | Length | Description      |
|--------|---------|--------|------------------|
| 4      | Address | 4      | OFB address      |
| 8      | Address | 4      | OFRL address     |
| 12     | Fixed   | 4      | OFR identifier   |
| 16     | Fixed   | 4      | Return code      |
| 20     | Fixed   | 4      | DBRC return code |

**3751**

**Module:**  
DFSLROIC Online Forward Recovery Controller

**Explanation:**  
Record cut after OFR ITASK created (Level - Low)

**Trace Subcode:**  
LROIC Start

Table 182. Trace record 3751 - create the OFR ITASK

| Offset | Type    | Length | Description       |
|--------|---------|--------|-------------------|
| 4      | Address | 4      | OFB address       |
| 8      | Address | 4      | OFRL address      |
| 12     | Fixed   | 4      | OFR identifier    |
| 16     | Address | 4      | ECB address       |
| 20     | Fixed   | 4      | Current OFR count |

**3752**

**Module:**  
DFSLROPR Online Forward Recovery Processor

**Explanation:**  
Record cut at entry to DFSLROPR (Level - Low)

**Trace Subcode:**  
LROPR Request

Table 183. Trace record 3752 - OFR processor request

| Offset | Type    | Length | Description                                            |
|--------|---------|--------|--------------------------------------------------------|
| 4      | Address | 4      | OFB address                                            |
| 8      | Address | 4      | OFRL address                                           |
| 12     | Address | 4      | Buffer address if AWLGFUNC=002E, AWE address otherwise |
| 16     | Fixed   | 2      | AWLGFUNC                                               |

Table 183. Trace record 3752 - OFR processor request (continued)

| Offset | Type      | Length | Description                                            |
|--------|-----------|--------|--------------------------------------------------------|
| 18     | Bit       | 1      | OFB_FLAGS -----                                        |
|        | 1... ..   | 1      | ofb_started                                            |
|        | .1.. ..   |        | ofb_in_merge                                           |
|        | ..1. .... |        | ofb_terminated                                         |
|        | ...1 .... |        | ofb_restarted                                          |
|        | .... 1... |        | ofb_pending                                            |
|        | .... .1.. |        | ofb_terminating                                        |
|        | .... ..11 |        | * -----                                                |
| 20     | Fixed     | 2      | Index to POS_SS entry if<br>AWLGFUNC=002E, 0 otherwise |

### 3753

**Module:**

DFSLROPR Online Forward Recovery Processor

**Explanation:**

Record cut at exit from DFSLROPR (Level - Low)

**Trace Subcode:**

LROPR Exit

Table 184. Trace record 3753 - OFR processor exit

| Offset | Type    | Length | Description                                               |
|--------|---------|--------|-----------------------------------------------------------|
| 4      | Address | 4      | OFB address                                               |
| 8      | Address | 4      | OFRL address                                              |
| 12     | Address | 4      | Buffer address if AWLGFUNC=002E, AWE<br>address otherwise |
| 16     | Fixed   | 2      | AWLGFUNC                                                  |
| 18     | Bit     | 2      | OFB_flags                                                 |
| 20     | Fixed   | 4      | OFR identifier                                            |

### 3754

**Module:**

DFSLRORH Online Forward Recovery Request Handler

**Explanation:**

Record cut for each log descriptor (LDS) (Level - Low)

**Trace Subcode:**

LROPR Log Desc

Table 185. Trace record 3754 - log descriptors obtained from DBRC

| Offset | Type      | Length | Description    |
|--------|-----------|--------|----------------|
| 4      | Address   | 4      | OFR identifier |
| 8      | Character | 8      | LDSD_ssid      |

Table 185. Trace record 3754 - log descriptors obtained from DBRC (continued)

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
| 16     | Character | 4      | LDSD_first_LSN(5:8)   |
| 20     | Character | 4      | LDSD_last_LSN(5:8)    |
| 24     | Bit       | 1      | LDSD_flags            |
| 26     | Fixed     | 2      | LDSD_mergeID          |
| 28     | Character | 4      | LDSD_prilog_time(5:8) |

### 3756

**Module:**

DFSLRORM Online Forward Recovery Read Next Data set

**Explanation:**

Record cut for each log descriptor (LDSD) (Level - Low)

**Trace Subcode:**

LRORM Log Desc

Table 186. Trace record 3756 - log descriptors obtained from DBRC

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
| 4      | Address   | 4      | OFR identifier        |
| 8      | Character | 8      | LDSD_ssid             |
| 16     | Character | 4      | LDSD_first_LSN(5:8)   |
| 20     | Character | 4      | LDSD_last_LSN(5:8)    |
| 24     | Bit       | 1      | LDSD_flags            |
| 26     | Fixed     | 2      | LDSD_mergeID          |
| 28     | Character | 4      | LDSD_prilog_time(5:8) |

### 3757

**Module:**

DFSLRORM - Online Forward Recovery Read Next Data Set

**Explanation:**

During OFR, DBRC returned a start point for a stream that was earlier than the stream's current routed position. (Level - Low)

**Trace Subcode:**

LRORM Startpoint Error

Table 187. Trace record 3757 - log descriptors obtained from DBRC

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 4      | Fixed     | 4      | pos_old_ptoken   |
| 8      | Character | 4      | pos_old_LSN(5:8) |
| 12     | Fixed     | 4      | pos_new_ptoken   |
| 16     | Character | 4      | pos_new_LSN(5:8) |
| 20     | Fixed     | 2      | ofb_flags(0-15)  |

Table 187. Trace record 3757 - log descriptors obtained from DBRC (continued)

| Offset | Type      | Length | Description          |
|--------|-----------|--------|----------------------|
| 22     | Fixed     | 2      | index to OFRL_entity |
| 28     | Character | 8      | DB/Area name         |

### 3758

**Module:**

DFSLROPR - Log Router Online Forward Recovery Processor

**Explanation:**

During OFR, the record ID (first LSN in buffer) of the next buffer to process is after the start LSN in the startpoints list (ofrsp\_start\_lsn) and the process has not yet reached this start LSN. (Level - Low)

**Trace Subcode:**

LRORM Startpoint Missed

Table 188. Trace record 3758 - start points list error detected

| Offset | Type      | Length | Description          |
|--------|-----------|--------|----------------------|
| 4      | Fixed     | 4      | pos_ptoken           |
| 8      | Character | 8      | pos_LSN              |
| 16     | Fixed     | 4      | index to OFRL_entity |
| 20     | Character | 4      | ofrsp_start_lsn(5:8) |
| 24     | Character | 4      | lgb_record_ID(5:8)   |

### 3760

**Module:**

DFSLRARC Auto Archive Controller

**Explanation:**

Record cut on entry to DFSLRARC for archive request (Level - Medium)

**Trace Subcode:**

LRARC Request

Table 189. Trace record 3760 - DFSLRARC auto archive controller entry

| Offset | Type      | Length | Description    |
|--------|-----------|--------|----------------|
| 4      | Fixed     | 2      | AWLGFUNC='3E'x |
| 6      | Character | 1      | *              |
| 7      | Character | 1      | AWLGAtype      |
| 8      | Character | 8      | AWLGASSID      |
| 16     | Character | 8      | AWLGATIME      |
| 24     | Character | 8      | AWLGRTIME      |

**Module:**

DFSLRARC Auto Archive Controller

**Explanation:**

Record cut on entry to DFSLRARC for available request (Level - Medium)

**Trace Subcode:**  
LRARC Request

Table 190. Trace record 3760 - DFSLRARC auto archive controller entry

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
| 4      | Fixed     | 2      | AWLGFUNC='3F'x      |
| 6      | Character | 2      | *                   |
| 8      | Fixed     | 4      | AAB address         |
| 12     | Bit       | 16     | AAB_flags           |
|        | 1... .... | 1      | AAB_START           |
|        | .1.. .... |        | AAB_INIT_ERROR      |
|        | ..1. .... |        | AAB_TERMINATE       |
|        | ...1 .... |        | AAB_BATCH           |
|        | .... 1..  |        | AAB_READER_EXIST    |
|        | .... .1.. |        | AAB_SAR_EXIST       |
|        | .... ..1. |        | AAB_LDSD_LAST       |
|        | .... ...1 |        | *                   |
|        | 1... .... | 1      | AAB_READ_COMPLETED  |
|        | .1.. .... |        | AAB_XBUF_ENQD       |
|        | ..1. .... |        | AAB_ALL_RB_RETURNED |
|        | ...1 .... |        | AAB_RDR_INALLOC     |
|        | .... 1..  |        | AAB_READ_ERROR      |
|        | .... .1.. |        | *                   |
|        | .... ..1. |        | AAB_READ_DCB        |
|        | .... ...1 |        | AAB_TS_DUAL         |
|        | 1... .... | 1      | AAB_TAP             |
|        | .1.. .... |        | AAB_EOV             |
|        | ..1. .... |        | AAB_WRITE_ERROR     |
|        | ...1 .... |        | *                   |
|        | .... 1..  |        | AAB_ARC_SLDS_DONE   |
|        | .... .1.. |        | AAB_AS_LAST_WRITE   |
|        | .... ..1. |        | AAB_AS_DCB          |
|        | .... ...1 |        | AAB_AS_DUAL         |
|        | 1... .... | 1      | AAB_RLDS_REQD       |
|        | .1.. .... |        | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |        | *                   |
|        | .... 1..  |        | AAB_ARC_RLDS_DONE   |
|        | .... .1.. |        | AAB_AR_LAST_WRITE   |
|        | .... ..1. |        | AAB_AR_DCB          |
|        | .... .... |        | AAB_AR_DUAL         |

**3761**

**Module:**  
DFSLRARC Auto Archive Controller

**Explanation:**  
Record cut on exit from DFSLRARC (Level - Medium)

**Trace Subcode:**  
LRARC Exit

Table 191. Trace record 3761 - DFSLRARC auto archive controller exit

| Offset | Type  | Length | Description   |
|--------|-------|--------|---------------|
| 4      | Fixed | 2      | Feedback code |

**3762**

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut on entry to DFSLRARP for archive request (Level - Medium)

**Trace Subcode:**

LRARP Request

Table 192. Trace record 3762 - DFSLRARP auto archive processor entry

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
| 4      | Fixed     | 2      | AWLGFUNC='3E'x      |
| 6      | Character | 2      | *                   |
| 8      | Fixed     | 4      | AAB address         |
| 12     | Character | 4      | LDSD_FLRID          |
| 16     | Fixed     | 4      | AAB_LDSD_LIST       |
| 20     | Character | 4      | LDSD_LLRID          |
| 24     | Character | 4      | *                   |
| 28     | Bit       | 16     | AAB_flags           |
|        | 1... .... | 1      | AAB_START           |
|        | .1.. .... |        | AAB_INIT_ERROR      |
|        | ..1. .... |        | AAB_TERMINATE       |
|        | ...1 .... |        | AAB_BATCH           |
|        | .... 1... |        | AAB_READER_EXIST    |
|        | .... .1.. |        | AAB_SAR_EXIST       |
|        | .... ..1. |        | AAB_LDSD_LAST       |
|        | .... ...1 |        | *                   |
|        | 1... .... | 1      | AAB_READ_COMPLETED  |
|        | .1.. .... |        | AAB_XBUF_ENQD       |
|        | ..1. .... |        | AAB_ALL_RB_RETURNED |
|        | ...1 .... |        | AAB_RDR_INALLOC     |
|        | .... 1... |        | AAB_READ_ERROR      |
|        | .... .1.. |        | *                   |
|        | .... ..1. |        | AAB_READ_DCB        |
|        | .... ...1 |        | AAB_TS_DUAL         |

Table 192. Trace record 3762 - DFSLRARP auto archive processor entry (continued)

| Offset | Type      | Length      | Description       |                     |
|--------|-----------|-------------|-------------------|---------------------|
|        | 1... ..   | 1           | AAB_TAP           |                     |
|        | .1.. ..   |             | AAB_EOV           |                     |
|        | ..1. .... |             | AAB_WRITE_ERROR   |                     |
|        | ...1 .... |             | *                 |                     |
|        | .... 1... |             | AAB_ARC_SLDS_DONE |                     |
|        | .... .1.. |             | AAB_AS_LAST_WRITE |                     |
|        | .... ..1. |             | AAB_AS_DCB        |                     |
|        | .... ...1 |             | AAB_AS_DUAL       |                     |
|        | 1... ..   |             | 1                 | AAB_RLDS_REQD       |
|        | .1.. ..   |             |                   | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |             |                   | *                   |
|        | .... 1... |             |                   | AAB_ARC_RLDS_DONE   |
|        | .... .1.. |             |                   | AAB_AR_LAST_WRITE   |
|        | .... ..1. |             |                   | AAB_AR_DCB          |
|        | .... ...1 | AAB_AR_DUAL |                   |                     |

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut on entry to DFSLRARP for return read buffer (Level - Medium)

**Trace Subcode:**

LRARP Entry

Table 193. Trace record 3762 - DFSLRARP auto archive processor entry

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
| 4      | Fixed     | 2      | AWLGFUNC='2E'x        |
| 6      | Character | 2      | *                     |
| 8      | Fixed     | 4      | AAB address           |
| 12     | Character | 4      | LRB_RECORD_ID         |
| 16     | Fixed     | 4      | AWLG_RBF_LRB          |
| 20     | Character | 4      | LRB_LLSN              |
| 24     | Bit       | 4      | AWE's flags           |
|        | 1... ..   |        | AWLG_RBF_READ_COMPLET |
|        | .1.. ..   |        | AWLG_RBF_IO_ERROR     |
|        | ..1. .... |        | AWLG_RBF_DATASET_OPEN |
|        | ...1 .... |        | LRB_BUFFER_DS_FULL    |
|        | .... 1... |        | LRB_BUFFER_IO_ABEND   |
|        | .... .1.. |        | LRB_READ_COMPLETE     |



Table 193. Trace record 3762 - DFSLRARP auto archive processor entry (continued)

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
|        | .... ..1. |        | LRB_BUFFER_ENDDS    |
|        | .... ...1 |        | LRB_AA_LAST_RETURN  |
| 25     | 1... .... |        | AWLG_RBF_NODATA     |
| 26     | Character | 2      | *                   |
| 28     | Bit       | 16     | AAB_flags           |
|        | 1... .... | 1      | AAB_START           |
|        | .1.. .... |        | AAB_INIT_ERROR      |
|        | ..1. .... |        | AAB_TERMINATE       |
|        | ...1 .... |        | AAB_BATCH           |
|        | .... 1... |        | AAB_READER_EXIST    |
|        | .... .1.. |        | AAB_SAR_EXIST       |
|        | .... ..1. |        | AAB_LDSD_LAST       |
|        | .... ...1 |        | *                   |
|        | 1... .... | 1      | AAB_READ_COMPLETED  |
|        | .1.. .... |        | AAB_XBUF_ENQD       |
|        | ..1. .... |        | AAB_ALL_RB_RETURNED |
|        | ...1 .... |        | AAB_RDR_INALLOC     |
|        | .... 1... |        | AAB_READ_ERROR      |
|        | .... .1.. |        | *                   |
|        | .... ..1. |        | AAB_READ_DCB        |
|        | .... ...1 |        | AAB_TS_DUAL         |
|        | 1... .... | 1      | AAB_TAP             |
|        | .1.. .... |        | AAB_EOV             |
|        | ..1. .... |        | AAB_WRITE_ERROR     |
|        | ...1 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_SLDS_DONE   |
|        | .... .1.. |        | AAB_AS_LAST_WRITE   |
|        | .... ..1. |        | AAB_AS_DCB          |
|        | .... ...1 |        | AAB_AS_DUAL         |
|        | 1... .... | 1      | AAB_RLDS_REQD       |
|        | .1.. .... |        | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_RLDS_DONE   |
|        | .... .1.. |        | AAB_AR_LAST_WRITE   |
|        | .... ..1. |        | AAB_AR_DCB          |
|        | .... ...1 |        | AAB_AR_DUAL         |

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut on entry to DFSLRARP for return write Buffer (Level - Medium)

**Trace Subcode:**

LRARP Entry

Table 194. Trace record 3762 - DFSLRARP auto archive processor entry

| Offset | Type      | Length | Description           |
|--------|-----------|--------|-----------------------|
| 4      | Fixed     | 2      | AWLGFUNC='08'x        |
| 6      | Character | 2      | *                     |
| 8      | Fixed     | 4      | AAB address           |
| 12     | Fixed     | 4      | *                     |
| 16     | Address   | 4      | AWLG_RTBBUFP          |
| 20     | Character | 4      | *                     |
| 24     | Bit       | 4      | AWE's flags           |
|        | 1... .... |        | AWLG_RTB_TRK          |
|        | .1.. .... |        | AWLG_RTB_ARC          |
|        | ..1. .... |        | AWLG_RTB_RLD          |
|        | ...1 .... |        | AWLG_RTB_WRITE_COMPLE |
|        | .... 1... |        | AWLG_RTB_IO_ERROR     |
|        | .... .1.. |        | AWLG_RTB_EOV          |
|        | .... .111 |        | *                     |
| 26     | Character | 2      | *                     |
| 28     | Bit       | 4      | AAB flags             |
|        | 1... .... | 1      | AAB_START             |
|        | .1.. .... |        | AAB_INIT_ERROR        |
|        | ..1. .... |        | AAB_TERMINATE         |
|        | ...1 .... |        | AAB_BATCH             |
|        | .... 1... |        | AAB_READER_EXIST      |
|        | .... .1.. |        | AAB_SAR_EXIST         |
|        | .... ..1. |        | AAB_LDSD_LAST         |
|        | .... ...1 |        | *                     |
|        | 1... .... | 1      | AAB_READ_COMPLETED    |
|        | .1.. .... |        | AAB_XBUF_ENQD         |
|        | ..1. .... |        | AAB_ALL_RB_RETURNED   |
|        | ...1 .... |        | AAB_RDR_INALLOC       |
|        | .... 1... |        | AAB_READ_ERROR        |
|        | .... .1.. |        | *                     |
|        | .... ..1. |        | AAB_READ_DCB          |
|        | .... ...1 |        | AAB_TS_DUAL           |

Table 194. Trace record 3762 - DFSLRARP auto archive processor entry (continued)

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
|        | 1... .... | 1      | AAB_TAP             |
|        | .1.. .... |        | AAB_EOV             |
|        | ..1. .... |        | AAB_WRITE_ERROR     |
|        | ...1 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_SLDS_DONE   |
|        | .... .1.. |        | AAB_AS_LAST_WRITE   |
|        | .... ..1. |        | AAB_AS_DCB          |
|        | .... ...1 |        | AAB_AS_DUAL         |
|        | 1... .... | 1      | AAB_RLDS_REQD       |
|        | .1.. .... |        | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |        | *                   |
|        | ... 1...  |        | AAB_ARC_RLDS_DONE   |
|        | ... .1..  |        | AAB_AR_LAST_WRITE   |
|        | ... ..1.  |        | AAB_AR_DCB          |
|        | ... ...1  |        | AAB_AR_DUAL         |

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut on entry to DFSLRARP for Auto Archive Data set (Level - Medium)

**Trace Subcode:**

LRARP Entry

Table 195. Trace record 3762 - DFSLRARP auto archive processor entry

| Offset | Type      | Length | Description            |
|--------|-----------|--------|------------------------|
| 4      | Fixed     | 2      | AWLGFUNC='47'x         |
| 6      | Character | 2      | AAB_TRK_LDSD_NUM       |
| 8      | Fixed     | 4      | AAB address            |
| 12     | Fixed     | 2      | *                      |
| 14     | Fixed     | 2      | AAB_TRK_ADS_IN         |
| 16     | Address   | 4      | AWLG_ADS_LTDCB         |
| 18     | Address   | 4      | AWLG_ADS_NUM_DATASETS  |
| 20     | Character | 4      | *                      |
| 24     | Bit       | 2      | AWLG_ADS_DSTYPE_flags  |
|        | 1... .... |        | AWLG_ADS_TRACKING_SLDS |
|        | .1.. .... |        | AWLG_ADS_ARCHIVE_SLDS  |
|        | ..1. .... |        | AWLG_ADS_ARCHIVE_RLDS  |
|        | ...1 1111 |        | *                      |
| 26     | Character | 2      | *                      |

Table 195. Trace record 3762 - DFSLRARP auto archive processor entry (continued)

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
| 28     | Bit       | 4      | AAB flags           |
|        | 1... ..   | 1      | AAB_START           |
|        | .1.. ..   |        | AAB_INIT_ERROR      |
|        | .1. ....  |        | AAB_TERMINATE       |
|        | ...1 .... |        | AAB_BATCH           |
|        | .... 1... |        | AAB_READER_EXIST    |
|        | .... .1.. |        | AAB_SAR_EXIST       |
|        | .... ..1. |        | AAB_LDSD_LAST       |
|        | .... ...1 |        | *                   |
|        | 1... ..   | 1      | AAB_READ_COMPLETED  |
|        | .1.. ..   |        | AAB_XBUF_ENQD       |
|        | .1. ....  |        | AAB_ALL_RB_RETURNED |
|        | ...1 .... |        | AAB_RDR_INALLOC     |
|        | .... 1... |        | AAB_READ_ERROR      |
|        | .... .1.. |        | *                   |
|        | .... ..1. |        | AAB_READ_DCB        |
|        | .... ...1 |        | AAB_TS_DUAL         |
|        | 1... ..   | 1      | AAB_TAP             |
|        | .1.. ..   |        | AAB_EOV             |
|        | .1. ....  |        | AAB_WRITE_ERROR     |
|        | ...1 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_SLDS_DONE   |
|        | .... .1.. |        | AAB_AS_LAST_WRITE   |
|        | .... ..1. |        | AAB_AS_DCB          |
|        | .... ...1 |        | AAB_AS_DUAL         |
|        | 1... ..   | 1      | AAB_RLDS_REQD       |
|        | .1.. ..   |        | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_RLDS_DONE   |
|        | .... .1.. |        | AAB_AR_LAST_WRITE   |
|        | .... ..1. |        | AAB_AR_DCB          |
|        | .... ...1 |        | AAB_AR_DUAL         |

**3763**

**Module:**

DFSLRARC Auto Archive Controller

**Explanation:**

Record cut after back from DBRC (Level - Medium)

**Trace Subcode:**

LRARP To DBRC

Table 196. Trace record 3763 - DFSLRARC get LDS list from DBRC

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 4      | Character | 4      | *           |
| 8      | Fixed     | 4      | AAB address |

Table 196. Trace record 3763 - DFSLRARC get LDS list from DBRC (continued)

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 12     | Fixed     | 4      | AAB_PRILOG_STIME |
| 20     | Fixed     | 4      | LDS FLRID        |
| 24     | Fixed     | 4      | LDS LLRID        |
| 28     | Character | 8      | AAB_LDS LIST     |

**3764**

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut after back from create Log Reader (Level - Medium)

**Trace Subcode:**

LRARP To Rdr

Table 197. Trace record 3764 - DFSLRARP after create log reader

| Offset | Type      | Length | Description      |
|--------|-----------|--------|------------------|
| 4      | Fixed     | 4      | Return code      |
| 8      | Fixed     | 4      | AAB address      |
| 12     | Fixed     | 4      | AAB_LDS LIST     |
| 16     | Fixed     | 4      | AAB_READ_RETQ    |
| 20     | Character | 4      | LDS FLRID        |
| 24     | Character | 4      | LDS LLRID        |
| 28     | Fixed     | 4      | AAB_READ_Routine |

**3765**

**Module:**

DFSLRARP Auto Archive Processor

**Explanation:**

Record cut at enqueue buffer to write (Level - Medium)

**Trace Subcode:**

LRARP To SAR

Table 198. Trace record 3765 - DFSLRARP enqueue buffer to write

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 4      | Fixed     | 4      | SAA address |
| 8      | Fixed     | 4      | AAB address |
| 12     | Character | 4      | First LSN   |
| 16     | Fixed     | 4      | LRB address |
| 20     | Character | 4      | Last LSN    |
| 28     | Bit       | 16     | AAB_flags   |

Table 198. Trace record 3765 - DFSLRARP enqueue buffer to write (continued)

| Offset | Type      | Length | Description         |
|--------|-----------|--------|---------------------|
|        | 1... .... | 1      | AAB_START           |
|        | .1.. .... |        | AAB_INIT_ERROR      |
|        | .1. ....  |        | AAB_TERMINATE       |
|        | ...1 .... |        | AAB_BATCH           |
|        | .... 1... |        | AAB_READER_EXIST    |
|        | .... .1.. |        | AAB_SAR_EXIST       |
|        | .... ..1. |        | AAB_LDSD_LAST       |
|        | .... ...1 |        | *                   |
|        | 1... .... | 1      | AAB_READ_COMPLETED  |
|        | .1.. .... |        | AAB_XBUF_ENQD       |
|        | .1. ....  |        | AAB_ALL_RB_RETURNED |
|        | ...1 .... |        | AAB_RDR_INALLOC     |
|        | .... 1... |        | AAB_READ_ERROR      |
|        | .... .1.. |        | *                   |
|        | .... ..1. |        | AAB_READ_DCB        |
|        | .... ...1 |        | AAB_TS_DUAL         |
|        | 1... .... | 1      | AAB_TAP             |
|        | .1.. .... |        | AAB_EOV             |
|        | .1. ....  |        | AAB_WRITE_ERROR     |
|        | ...1 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_SLDS_DONE   |
|        | .... .1.. |        | AAB_AS_LAST_WRITE   |
|        | .... ..1. |        | AAB_AS_DCB          |
|        | .... ...1 |        | AAB_AS_DUAL         |
|        | 1... .... | 1      | AAB_RLDS_REQD       |
|        | .1.. .... |        | AAB_ARC_RLDS_DELETE |
|        | ..11 .... |        | *                   |
|        | .... 1... |        | AAB_ARC_RLDS_DONE   |
|        | .... .1.. |        | AAB_AR_LAST_WRITE   |
|        | .... ..1. |        | AAB_AR_DCB          |
|        | .... ...1 |        | AAB_AR_DUAL         |

**3770**

**Module:**

DFSLRILT Isolated Log Control Routine

**Explanation:**

Record cut at entry to DFSLRILT (Level - Low)

**Trace Subcode:**

LRILT Request

Table 199. Trace record 3770 - isolated log transport control routine entry

| Offset | Type  | Length | Description            |
|--------|-------|--------|------------------------|
| 4      | Fixed | 4      | Log router AWE address |
| 8      | Fixed | 2      | Reserved               |
| 10     | Fixed | 2      | Isolated log request   |

Table 199. Trace record 3770 - isolated log transport control routine entry (continued)

| Offset | Type      | Length | Description    |
|--------|-----------|--------|----------------|
| 12     | Character | 16     | AWE parameters |

**3771**

**Module:**

DFSLRILT Isolated Log Control Routine

**Explanation:**

Record cut at exit from DFSLRILT (Level - Low)

**Trace Subcode:**

LRILT Exit

Table 200. Trace record 3771 - isolated log transport control routine exit

| Offset | Type  | Length | Description            |
|--------|-------|--------|------------------------|
| 4      | Fixed | 4      | Log router AWE address |
| 8      | Fixed | 2      | Isolated log request   |
| 10     | Fixed | 2      | Feedback code          |
| 12     | Fixed | 4      | Return code            |

**3772**

**Module:**

DFSLRSCM Isolated Log Send Routine

**Explanation:**

Record cut at entry to DFSLRSCM (Level - Low)

**Trace Subcode:**

LRSCM Send

Table 201. Trace record 3772 - isolated log transport send routine entry

| Offset | Type  | Length | Description     |
|--------|-------|--------|-----------------|
| 4      | Fixed | 2      | ILTR length     |
| 6      | Fixed | 2      | ILTR type       |
| 8      | Fixed | 4      | ILTR Sequence # |
| 12     | Fixed | 16     | Trace Data      |

**3773**

**Module:**

DFSLRICM Isolated Log Schedule Control Message Routine

**Explanation:**

Record cut at entry to DFSLRICM (Level - Low)

**Trace Subcode:**

LRICM Receive

---

Table 202. Trace record 3773 - isolated log transport schedule control message

---

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 4      | Character | 24     | Trace data  |

---

**3774**

**Module:**

DFSLRICM Isolated Log Schedule Control Message Routine

**Explanation:**

Record cut at entry to DFSLRICM Gap Fill Response (Level - Low)

**Trace Subcode:**

LRICM Gap Fill

---

Table 203. Trace record 3774 - isolated log transport gap fill

---

| Offset | Type      | Length | Description    |
|--------|-----------|--------|----------------|
| 4      | Fixed     | 2      | Request ID     |
| 6      | Fixed     | 2      | Request status |
| 8      | Fixed     | 4      | Num data sets  |
| 10     | Fixed     | 4      | PRILOG token   |
| 16     | Character | 8      | PRILOG time    |

---

**3775**

**Module:**

DFSLRICM Isolated Log Schedule Control Message Routine

**Explanation:**

Record cut at entry to DFSLRICM Query Response (Level - Low)

**Trace Subcode:**

LRICM Query

---

Table 204. Trace record 3775 - isolated log transport query response

---

| Offset | Type  | Length | Description       |
|--------|-------|--------|-------------------|
| 4      | Fixed | 4      | PRILOG token      |
| 8      | Fixed | 4      | High PRILOG token |
| 12     | Fixed | 4      | DBRC return code  |

---

**3776**

**Module:**

DFSLRICM Isolated Log Schedule Control Message Routine

**Explanation:**

Record cut at entry to DFSLRICM DS Abort (Level - Low)

**Trace Subcode:**

LRICM DS Abort



Table 205. Trace record 3776 - isolated log transport DS abort

| Offset | Type      | Length | Description  |
|--------|-----------|--------|--------------|
| 4      | Fixed     | 2      | Request ID   |
| 6      | Fixed     | 1      | Reserved     |
| 7      | Fixed     | 1      | Flags        |
| 8      | Character | 8      | First LSN    |
| 15     | Character | 4      | Last LSN     |
| 18     | Character | 4      | End data set |

**3777**

**Module:**

DFSLRIDS Isolated Log DS Processor Routine

**Explanation:**

Record cut at entry to DFSLRIDS Receive DS (Level - Low)

**Trace Subcode:**

LRIDS Receive

Table 206. Trace record 3777 - isolated log transport receive DS

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 4      | Fixed     | 2      | Request ID  |
| 5      | Fixed     | 2      | Reserved    |
| 8      | Character | 4      | First LSN   |
| 12     | Character | 4      | Last LSN    |
| 16     | Fixed     | 4      | gds address |
| 20     | Fixed     | 4      | sra address |
| 24     | Fixed     | 4      | stb address |

**3778**

**Module:**

DFSLRIDS Isolated Log DS Processor Routine

**Explanation:**

Record cut at entry to DFSLRIDS Send OK (Level - Low)

**Trace Subcode:**

LRIDS Send OK

Table 207. Trace record 3778 - isolated log transport send OK

| Offset | Type  | Length | Description     |
|--------|-------|--------|-----------------|
| 4      | Fixed | 2      | ILTR type       |
| 6      | Fixed | 2      | Reserved        |
| 8      | Fixed | 4      | ILTR Sequence # |

**3779****Module:**

DFSLRIDS Isolated Log DS Processor Routine

**Explanation:**

Record cut at entry to DFSLRIDS DS Received (Level - Low)

**Trace Subcode:**

LRIDS Received

*Table 208. Trace record 3779 - isolated log transport DS received*

| Offset | Type  | Length | Description |
|--------|-------|--------|-------------|
| 4      | Fixed | 2      | Request ID  |
| 6      | Fixed | 2      | Reserved    |
| 8      | Fixed | 4      | SRA address |
| 12     | Fixed | 4      | STB address |

**377A****Module:**

DFSLRIDS Isolated Log DS Processor Routine

**Explanation:**

Record cut at entry to DFSLRIDS DS Abort (Level - Low)

**Trace Subcode:**

LRIDS DS Abort

*Table 209. Trace record 377A - isolated log transport DS abort*

| Offset | Type      | Length | Description                                          |
|--------|-----------|--------|------------------------------------------------------|
| 4      | Fixed     | 2      | Request ID                                           |
| 6      | Fixed     | 1      | Reserved                                             |
| 7      | Fixed     | 1      | Flags                                                |
|        | 1.....    |        | Data set temporarily unavailable, immediate retry ok |
|        | .1.....   |        | Data set temporarily unavailable, defer retry        |
|        | ..1.....  |        | Begin data set not sent                              |
| 8      | Character | 8      | First LSN                                            |
| 16     | Character | 4      | Last LSN                                             |
| 20     | Character | 4      | End DS LSN                                           |

**Trace Entry: Log router miscellaneous trace codes (378x)****Module:**

DFSLRMIL Milestone Processor Routine

**Explanation:**

Record cut at entry to DFSLRMIL (Level - Low)

**Trace Subcode:**

LRMIL entry

**3780***Table 210. Trace record 3780 - milestone request entry*

| Offset | Type      | Length | Description                 |
|--------|-----------|--------|-----------------------------|
| 4      | Fixed     | 4      | Milestone index             |
| 8      | Fixed     | 4      | LGB current milestone index |
| 12     | Character | 1      | Flags                       |
|        | 1.....    |        | Shutdown milestone          |
|        | .1.....   |        | Takeover milestone          |
|        | ..1.....  |        | Timer pop                   |
| 24     | Character | 8      | Time stamp                  |

**3781****Module:**

DFSLRMIL Milestone Processor Routine

**Explanation:**

Record cut at exit to DFSLRMIL (Level - Medium)

**Trace Subcode:**

LRMIL entry

*Table 211. Trace record 3781 - milestone complete*

| Offset | Type      | Length | Description                 |
|--------|-----------|--------|-----------------------------|
| 4      | Fixed     | 4      | Milestone index             |
| 8      | Fixed     | 4      | LGB current milestone index |
| 12     | Character | 1      | Flags                       |
|        | 1.....    |        | Shutdown milestone          |
|        | .1.....   |        | Takeover milestone          |
|        | ..1.....  |        | Timer pop                   |
| 13     | Character | 3      | Spares                      |
| 16     | Fixed     | 4      | LGB restart milestone index |
| 24     | Character | 8      | Time stamp                  |

**3782****Module:**

DFSLRTRK0 Unplan Takeover Process Routine

**Explanation:**

Record cut at entry to unplan takeover phase 1 (Level - Low)

**Trace Subcode:**

LRTKO entry

*Table 212. Trace record 3782 - unplanned takeover process phase 1 entry*

| Offset | Type            | Length | Description                                                    |
|--------|-----------------|--------|----------------------------------------------------------------|
| 4      | Bit             | 16     | lgb_takeover_flags                                             |
|        | 1..... .....    |        | On if planned takeover requested                               |
|        | .1..... .....   |        | On if planned takeover in progress                             |
|        | ..1..... .....  |        | On if unplanned takeover requested                             |
|        | ...1.... .....  |        | On if unplanned takeover in progress                           |
|        | ....1... .....  |        | On if takeover reversed                                        |
|        | .....1. ....... |        | On if unplanned takeover is pending                            |
|        | .....1. ....... |        | On if planned takeover is pending                              |
|        | .....1 .....    |        | On if 'takeover start' notify to DBRC has been done            |
|        | ..... 1.....    |        | On if log truncation is complete                               |
|        | ..... .1.....   |        | On if NOREVERSE was specified on the /RTA UNPLAN command       |
|        | ..... ..1....   |        | On if unhardened buffers were processed for unplanned takeover |
|        | ..... ...11111  |        | Spares (last 5 bits reserved)                                  |
| 8      | Fixed           | 4      | LGB current milestone index                                    |
| 24     | Character       | 8      | Time stamp                                                     |

**3783****Module:**

DFSLRTKO Unplan Takeover Process Routine

**Explanation:**

Record cut at entry to unplan takeover phase 2 (Level - Low)

**Trace Subcode:**

LRTKO entry

Table 213. Trace record 3783 - unplanned takeover process phase 2 entry

| Offset | Type      | Length | Description                 |
|--------|-----------|--------|-----------------------------|
| 4      | Fixed     | 4      | LGB current milestone index |
| 24     | Character | 8      | Time stamp                  |

**3784**

**Module:**

DFSLRMST Master ITASK process Routine

**Explanation:**

Record cut at entry to DFSLRMST (Level - Low)

**Trace Subcode**

LRTKO entry

Table 214. Trace record 3784 - log router master ITASK request

| Offset | Type  | Length | Description                            |
|--------|-------|--------|----------------------------------------|
| 4      | Fixed | 4      | Function code                          |
| 8      | Fixed | 4      | Request AWE's AWLGCECB                 |
| 12     | Fixed | 4      | Data pointed by request AWE's AWLGCECB |

**3785**

**Module:**

DFSLRMST Master ITASK process Routine

**Explanation:**

Record cut after done the request to DFSLRMST (Level - Low)

**Trace Subcode:**

LRTKO entry

Table 215. Trace record 3785 - log router master ITASK request done

| Offset | Type      | Length | Description   |
|--------|-----------|--------|---------------|
| 4      | Fixed     | 4      | Function code |
| 24     | Character | 8      | Time stamp    |

**3786**

**Module:**

DFSLRMST Master ITASK process Routine

**Explanation:**

Record cut at exit to DFSLRMST (Level - Low)

**Trace Subcode:**

LRTKO entry

Table 216. Trace record 3786 - log router master ITASK exit

| Offset | Type      | Length | Description |
|--------|-----------|--------|-------------|
| 24     | Character | 8      | Time stamp  |

**3787****Module:**

DFSLREDT End Database/Area Tracking Routine

**Explanation:**

Record cut at entry to DFSLREDT (Level - Low)

**Trace Subcode:**

LRTKO entry

*Table 217. Trace record 3787 - log router end database tracking*

| Offset | Type      | Length | Description     |
|--------|-----------|--------|-----------------|
| 4      | Character | 8      | Database name   |
| 14     | Character | 8      | Area name       |
| 20     | Fixed     | 4      | Milestone index |

**3788****Module:**

DFSLRCAS Create Active Stream Routine

**Explanation:**

Record cut at begin planned takeover (Level - Low)

**Trace Subcode:**

LRTKO entry

*Table 218. Trace record 3788 - create active stream begin takeover*

| Offset | Type         | Length | Description                                         |
|--------|--------------|--------|-----------------------------------------------------|
| 4      | Fixed        | 4      | LGB current mile index                              |
| 8      | Fixed        | 4      | LGB plan tko token                                  |
| 12     | Bit          | 16     | lgb_flags                                           |
|        | 1..... ..    |        | On if we are terminating                            |
|        | .1..... ..   |        | Transport Manager Subsystem (TMS) has terminated    |
|        | ..1..... ..  |        | On if we are identified to TM                       |
|        | ...1.... ..  |        | On if /STO SERVGRP entered                          |
|        | ....1... ..  |        | On if /STA SERVGRP entered                          |
|        | .....1.. ..  |        | On during log router restart                        |
|        | .....1. .... |        | On if LR termination is waiting for OFR to shutdown |
|        | .....1 ..... |        | On if initialization is complete                    |
|        | ..... 1..... |        | On if no restart mpb from log                       |

Table 218. Trace record 3788 - create active stream begin takeover (continued)

| Offset | Type            | Length | Description                                                    |
|--------|-----------------|--------|----------------------------------------------------------------|
|        | ..... .1.....   |        | On if quiesce itasks for ptk                                   |
|        | ..... ..1.....  |        | On if this is the restart after a takeover                     |
|        | ..... ...1....  |        | Position set from ds                                           |
|        | ..... ....1...  |        | On if set from 51 pos                                          |
|        | ..... .....1..  |        | On if xrc tracking requested                                   |
|        | ..... .....11   |        | Spares (last 2 bits reserved)                                  |
| 14     | Bit             | 16     | lgb_takeover_flags                                             |
|        | 1..... .....    |        | On if planned takeover requested                               |
|        | .1..... .....   |        | On if planned takeover in progress                             |
|        | ..1..... .....  |        | On if unplanned takeover requested                             |
|        | ...1.... .....  |        | On if unplanned takeover in progress                           |
|        | ....1... .....  |        | On if takeover reversed                                        |
|        | .....1.. .....  |        | On if unplanned takeover is pending                            |
|        | .....1. ....... |        | On if planned takeover is pending                              |
|        | .....1 .....    |        | On if 'takeover start' notify to DBRC has been done            |
|        | ..... 1.....    |        | On if log truncation is complete                               |
|        | ..... .1.....   |        | On if NOREVERSE was specified on the /RTA UNPLAN command       |
|        | ..... ..1.....  |        | On if unhardened buffers were processed for unplanned takeover |
|        | ..... ...11111  |        | Spares (last 5 bits reserved)                                  |
| 24     | Character       | 8      | Time stamp                                                     |

## X'4930': database tracker FSE error log record format

The log record layout for X'4930' is described with offset and length.

Table 219. X'4930' log record layout

| Offset (hex) | Length | Description   |
|--------------|--------|---------------|
| 00           | 2      | Record length |

Table 219. X'4930' log record layout (continued)

| Offset (hex) | Length | Description                  |
|--------------|--------|------------------------------|
| 02           | 2      | X'0000'                      |
| 04           | 1      | X'49' record type            |
| 05           | 1      | X'30' record sub-type        |
| 06           | 2      | Not used                     |
| 08           | 8      | DBD name                     |
| 10           | 8      | DD name                      |
| 18           | 4      | RBA/RBN                      |
| 1C           | 8      | Log sequence number          |
| 24           | 8      | Subsystem ID                 |
| 2C           | 12     | Prilog time                  |
| 38           | 4      | Update sequence number (USN) |

**Related reference**

“Log records” on page 515

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.



## Chapter 19. SYS - System service aids

Various tools, utilities, and traces can help you analyze IMS system problems.

### Related reference

“Sequential buffering service aids” on page 220

When you receive a message or abend that indicates a problem with sequential buffering (SB), several diagnostic tools are available. Some of these tools are useful for diagnosing other IMS database-related problems.

### Log records

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

In addition, the content of the log records frequently contains information that you can use in your keyword string or when reviewing existing APAR descriptions and comparing them to your own situation.

You can obtain individual log record DSECTs by assembling the ILOGREC macro, and including a RECID format statement for the log record that you want. For example:

- ILOGREC RECID=01 - to format the DSECT for an IMS TYPE01 log record
- ILOGREC RECID=56 - to format the DSECT for an IMS TYPE56 log record

For Fast Path log record formats, you can assemble mapping macros DBFLSRT, DBFLGRQ, DBFLGRIM, DBFLGROM, DBFLGRSD, DBFLGSYN, and DBFBMSDB.

The following table describes the IMS log records, including the conditions that cause the records to be written.

Table 220. IMS log records used to analyze IMS problems

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                    |
|-------|--------------------|------------|-----------------------------------------------------------------------------------------------------------------|
| X'01' | QLOGMSGP           | QLOGMSGP   | Data was put in a message queue buffer. Caller is data communication. (DFSQLOG0)                                |
| X'02' | DFSLOG02           | CMLOG      | A <b>/LOG</b> command or a command that alters data required for restart was successfully completed. (DFSICLP0) |
| X'03' | QLOGMSGP           | QLOGMSGP   | Data was put in a message queue buffer. Caller is DL/I. (DFSQLOG0)                                              |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type    | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------|--------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'04'   | DFSLOG04           | DFSLOG04   | Relays information to the RSR tracking site for one of the following conditions:<br><b>X'01'</b><br>Start planned takeover (DFSICM30, DFSRST00)<br><b>X'02'</b><br>Sharing started (DFSRDBS0)<br><b>X'03'</b><br>Subsystem recovery complete (DFSBACK0, DFSFDR00, DFSRLP00)<br><b>X'04'</b><br>Subsystem stopped sharing (DBFLBEV0)<br><b>X'05'</b><br>Invalidate all buffers (DFSRDBS0)<br><b>X'06'</b><br>Sharing needs to be reevaluated (DFSRDBS0)<br><b>X'07'</b><br>Merge other logs (DBFLBEV0)<br><b>X'08'</b><br>Batch backout update UOR (DFSBACK0, DFSDBDR0, DFSRBLB0, DFSRBOIO)<br><b>X'09'</b><br>Log buffers purged (DFSTRM00)<br><b>X'FF'</b><br>Idling record (DFSLLRIO) |
| X'06'   | DFSLOG06           | ACLOGREC   | IMS was started or stopped, or FEOV was issued. The VTAM TPEND exit routine was entered or the IRLM failed in an IMS XRF complex. A <b>/SWITCH</b> command was processed in an IMS XRF complex. A <b>/START</b> command connected IMS to VTAM. Data sharing capability was quiesced. (DFSLLG0, DFSFDLM0, DFSICA20, DFSICL40, DFSRDSH0)                                                                                                                                                                                                                                                                                                                                                  |
| X'07'   | DFSLOG07           | DLREC      | An application program terminated. (DFSRBLB0, DFSRBOIO, DFSSABN0, DFSDABN0, DFSDLA30, DFSTMAD0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X'08'   | DFSLOG08           | LINTREC    | An application program was scheduled. (DFSSMSC0, DFSSBMP0, DFSDASPO, DFSDLA30, DFSTMAD0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| X'09'   | SBLOGREC           | SBLOGREC   | An application potentially using sequential buffering terminated. The following subcodes, contained within the log record, identify the type of statistics written in the log record. (DFSSBTD0)<br><b>X'01'</b><br>Sequential buffering summary statistic for the PST.<br><b>X'02'</b><br>Sequential buffering detailed statistics for each SDSG.                                                                                                                                                                                                                                                                                                                                      |
| X'0A07' | DFSLOG0A           | LOAREC     | A CPI-communications driven application program terminated. (DFSSABN0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| X'0A08' | DFSLOG0A           | LOAREC     | A CPI-communications driven application program was scheduled. (DFSSMSC0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                    |
|-------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'10' | DFSLOG10           | SCREC      | A security violation occurred. (DFSICIO0, DFSCMD30, DFSICLZ0, DFSTMAD0)                                                                                                                                                                                                                         |
| X'11' | LCONVERS           | LCONVERS   | A conversational program started. (DFSCON00)                                                                                                                                                                                                                                                    |
| X'12' | LCONVERS           | LCONVERS   | A conversational program terminated. (DFSCON20)                                                                                                                                                                                                                                                 |
| X'13' | DFSLOG13           | LOG13      | This log record contains conversational CCBs at logon for static non-ISC terminal, signon for ETO user, or static ISC allocation. (DFSRMD00)                                                                                                                                                    |
| X'18' | DFSLOG18           | XLOG18     | A user program established intent to use extended checkpoint and then issued a CHPK call. The user program issued a CHPK by issuing an XRST call with eight blank characters as a checkpoint ID value. (DFSZSC00)                                                                               |
| X'20' | DFSLOG20           | ILRDOC     | A database was opened. (DFSDLOC0)                                                                                                                                                                                                                                                               |
| X'21' | DFSLOG20           | ILRDOC     | A database was closed. (DFSDLOC0)                                                                                                                                                                                                                                                               |
| X'22' | DFSLOG22           | DFSLOG22   | A type-2 command completed successfully and is recoverable across a restart. (DBFCPRC0, DBFRTS00, DFSCPDD0, DFSCPSM0, DFSDBS00, DFSIC020, DFSIC160, DFSID020, DFSID160, DFSIU070, DFSIU090, DFSIU100, DFSIU110, DFSIU120, DFSIU160, DFSMLS00, DFSMNS00, DFSMPS00, DFSMRS00, DFSPGS00, DFSTRS00) |
| X'23' | DFSLOG23           | LOG23DSC   | The listed databases were open when a batch application requested a checkpoint. (DFSRDBL0)                                                                                                                                                                                                      |
| X'24' | DFSLOG24           | ERLGDSC    | The buffer handler detected an I/O error. (DFSDVSM0, DBFMER00)                                                                                                                                                                                                                                  |
| X'25' | DFSLOG25           | EEQLOG     | An EEQE was created or deleted. (DFSTOLG0)                                                                                                                                                                                                                                                      |
| X'26' | DFSLOG26           | IOTBUF     | An I/O toleration buffer was created. (DFSTOLG0)                                                                                                                                                                                                                                                |
| X'27' | DFSLOG27           | DBXLOG     | A data set was extended, according to these subcodes:<br><b>X'01'</b><br>Data set extend phase 1. (DFSDVSM0)<br><b>X'02'</b><br>Data set extend phase 2. (DFSDBHI0)                                                                                                                             |
| X'28' | DFSLOG28           | PH1DC      | The IMS restart facility updated the sequence numbers of input messages for response mode non-Fast Path transactions from STSN devices. (DFSFXC40)                                                                                                                                              |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|--------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'29' | DFSLOG29           | DFSLOG29   | <p>The progress of a HALDB online reorganization is represented in the following subcodes:</p> <p><b>X'00'</b><br/>The OLR command was received. (DFSORC00, DFSORC10)</p> <p><b>X'03'</b><br/>IMS catalog activity record. (DFS3SMF)</p> <p><b>X'10'</b><br/>Ownership of the reorganization for a partition was established through DBRC. (DFSORP60)</p> <p><b>X'11'</b><br/>Conditional ownership established. An attempt to establish ownership will be made. (DFSORP60)</p> <p><b>X'20'</b><br/>The <b>UPDATE OLREORG</b> command updated either the RATE option or the [NO]DEL option for a HALDB partition. (DFSORC00, DFSORC10)</p> <p><b>X'30'</b><br/>The output data sets were successfully validated or created. One record includes all output data sets. (DFSORA00, DFSRDBL0)</p> <p><b>X'40'</b><br/>Cursor active. Initialization of the reorganization of the partition was completed successfully, two sets of data sets exist, and copying is about to begin. The partition is now in cursor-active status. (DFSORP60, DFSORP70)</p> <p><b>X'50'</b><br/>The cursor was updated, but the unit of reorganization was not committed. (DFSORP20)</p> <p><b>X'70'</b><br/>Cursor inactive. Copying from the input to the output data sets has completed. The output data sets become active, and the input data sets become inactive. (DFSORP60, DFSORP70)</p> <p><b>X'71'</b><br/>Conditional cursor inactivate. An attempt to reset the cursor will be made. (DFSORP60)</p> <p><b>X'90'</b><br/>Ownership of the reorganization for a partition was relinquished. This is followed by the X'07' log record for OLR ITASK termination. (DFSORP60)</p> |
| X'30' | QLOGMSGI           | QLOGMSGI   | A message prefix was changed. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| X'31' | QLOGGETU           | QLOGGETU   | A GU was issued for a message. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| X'32' | QLOGREJE           | QLOGREJE   | A message was rejected. It was presumed to have been the cause of an application program abend. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'33' | QLOGFREE           | QLOGFREE   | The queue manager released a record. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| X'34' | QLOGCANC           | QLOGCANC   | A message was canceled. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| X'35' | QLOGENQU           | QLOGENQU   | A message was enqueued or re-enqueued. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name  | DSECT name          | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------|---------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'36' | QLOGDEQS            | QLOGDEQS            | A message was dequeued or saved or deleted. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| X'37' | DFSXFER<br>QLOGXFER | DFSXFER<br>QLOGXFER | <p>Records marked as NO INPUT and NO OUTPUT are written by the sync point coordinator when all resource managers have completed Phase 1. (DFSFXC30, DBFSLG20)</p> <p>Records marked as NO INPUT and NO OUTPUT (for example, X'3730') are also written by the DBCTL sync point processor after receiving a phase 2 commit request. (DFSDSC00)</p> <p>Phase 2 DC processing. One or more output messages were transferred from a queue block anchored off the PST temporary output queue to a permanent destination. There is a X'37' record for each destination that has messages transferred. (DFSQLOG0)</p> |
| X'38' | QLOGRELI            | QLOGRELI            | <p>An input message was put back on the input queue when the application abnormally terminated. (DFSQLOG0)</p> <p>Records marked as "Release with no input message" (for example, X'3801') are written by the DBCTL sync point processor (DFSDSC00) after receiving an abort request.</p> <p>A Protected Conversation has been put in doubt, and the input message has been moved to an RRE until the unit of work is aborted or committed.</p> <p>This record is logged for each message returned to its original anchor block (SMB or CNT) after QCF has abnormally terminated.</p>                         |
| X'39' | QLOGRELO            | QLOGRELO            | The output queue was freed during cleanup processing of a RELEASE call. (DFSQLOG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| X'3A' | QLFXFREE            | QLFXFREE            | A bitmap record was replaced after a queue record was freed at the end of DFSQFIX0 processing. (DFSQFIX0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| X'3B' | QLFXRERR            | QLFXRERR            | An invalid message record or a nonrecoverable message response was detected during queue validation. (DFSQFIX0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| X'3C' | QLFXBERR            | QLFXBERR            | A control block was changed during validation by DFSQFIX0. (DFSQFIX0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X'3D' | QLFXQBLK            | QLFXQBLK            | A QBLK record was altered during DFSQFIX0 processing. (DFSQFIX0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|--------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'40' | DFSCHKPT           | LOG01      | <p>A checkpoint was taken. The following subcodes in the log record precede and identify each type of information written in the log record.</p> <p><b>X'01'</b><br/>Checkpoint information begins here. (DFSRCP00)</p> <p><b>X'02'</b><br/>Message queue checkpoint record. (DFSQCP00)</p> <p><b>X'03'</b><br/>CNTs or LNBs, or both, follow. (DFSRCP30)</p> <p><b>X'04'</b><br/>SMBs follow. (DFSRCP30)</p> <p><b>X'05'</b><br/>Non-VTAM CTBs follow. (DFSRCP30)</p> <p><b>X'06'</b><br/>DMBs follow. (DFSRCP40)</p> <p><b>X'07'</b><br/>PSB follows. (DFSRCP40)</p> <p><b>X'08'</b><br/>Non-VTAM CLB, LLB, or both, follow. (DFSRCP30)</p> <p><b>X'0C'</b><br/>CVB follows. (DFSRCP30)</p> <p><b>X'0D'</b><br/>CCBs follow. (DFSRCP30)</p> <p><b>X'0F'</b><br/>Message queues TTR and LCB follow. (DFSRCP30)</p> <p><b>X'10'</b><br/>Non-VTAM CRBs follow. (DFSRCP30)</p> <p><b>X'12'</b><br/>Tran input edit routine table. (DFSRCP30)</p> <p><b>X'14'</b><br/>SPQBs and related CNTs follow. (DFSRCP30)</p> <p><b>X'20'</b><br/>Non-VTAM CIBs follow. (DFSRCP30)</p> <p><b>X'21'</b><br/>VTAM VTGBs follow. (DFSRCP30)</p> <p><b>X'22'</b><br/>Subcode for Queue Anchor Block (QAB). (DFS6CKP0)</p> <p><b>X'23'</b><br/>Subcode for LU 6.2 descriptors modified by <b>/CHANGE DESCRIPTOR</b> command. (DFS6CKP0)</p> <p><b>X'24'</b><br/>Subcode for LU 6.2 TIB. (DFS6CKP0)</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type                 | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'40'<br>(continued) | DFSCHKPT           | LOG01      | <p><b>X'25'</b><br/>EEQE follows. (DFSTOLG0)</p> <p><b>X'26'</b><br/>I/O toleration buffer follows. (DFSTOLG0)</p> <p><b>X'27'</b><br/>Contains database updates for an in-doubt unit of recovery. (DFSRCP40)</p> <p><b>X'28'</b><br/>Error queue elements (EQEL) for recovery in-doubt structure (RIS). (DFSRCP40)</p> <p><b>X'30'</b><br/>RREs follow. (DFSRCP50)</p> <p><b>X'31'</b><br/>SIDXs follow. (DFSRCP50)</p> <p><b>X'32'</b><br/>TPIPE/YQAB follow. (DFSYCKP0)</p> <p><b>X'33'</b><br/>MTE follow. (DFSYCKP0)</p> <p><b>X'34'</b><br/>TIB follow. (DFSYCKP0)</p> <p><b>X'35'</b><br/>OTMA (DFSYCKP0)</p> <p><b>X'36'</b><br/>MSC logical link blocks (LLB, LTB1, LTB2, CRB) follow. (DFSRCP30)</p> <p><b>X'37'</b><br/>MSC physical link blocks (LCB, CTT) follow. (DFSRCP30)</p> <p><b>X'38'</b><br/>MSC PCB for bandwidth follows. (DFSRCP30)</p> <p><b>X'39'</b><br/>MSC remote LTERM (RCNT). (DFSRCP30)</p> <p><b>X'40'</b><br/>Remote LTERM follows. (DFSRCP30)</p> <p><b>X'70'</b><br/>MSDB record follows. (DBFHDMPO)</p> <p><b>X'71'</b><br/>ECNT follows. (DBFHDMPO)</p> <p><b>X'72'</b><br/>MSDB header follows. (DBFHDMPO)</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type                 | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|--------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'40'<br>(continued) | DFSCHKPT           | LOG01      | <p><b>X'73'</b><br/>Page fixed MSDBs follow. (DBFHDMPO)</p> <p><b>X'74'</b><br/>Pageable MSDBs follow. (DBFHDMPO)</p> <p><b>X'79'</b><br/>MSDB record ends. (DBFHDMPO)</p> <p><b>X'80'</b><br/>Fast Path checkpoint information begins here. (DBFCHKP0)</p> <p><b>X'81'</b><br/>Snaps the current subpool information for use during warm and emergency restart.</p> <p><b>X'82'</b><br/>EMHB follows. (DBFCHKP0)</p> <p><b>X'83'</b><br/>RCTE follows. (DBFCHKP0)</p> <p><b>X'84'</b><br/>DMCB and DMAC follow. (DBFCHKP0)</p> <p><b>X'85'</b><br/>MTO buffer follows. (DBFCHKP0)</p> <p><b>X'86'</b><br/>DMHR and DEDB buffers follow. (DBFCHKP0)</p> <p><b>X'87'</b><br/>ADSC follows. (DBFCHKP0)</p> <p><b>X'88'</b><br/>Fast Path IEEQEs. (DBFCHKP0)</p> <p><b>X'89'</b><br/>Fast Path checkpoint information ends here. (DBFCHKP0)</p> <p><b>X'98'</b><br/>Checkpoint information ends here. (DFSRCP10)</p> <p><b>X'99'</b><br/>The message queue checkpoint information ends here. (DFSQCP00)</p> |
| X'41'                | DFSLOG41           | LOG41DSC   | A batch program or BMP program issued a checkpoint. (DFSRDBL0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'42'                | DFSLOG42           | ATLOGREC   | IMS switched from one OLDS to another, or a checkpoint was taken, or a shutdown checkpoint was taken. (DFSFDLS0, DFSRDS00, DFSRCP00)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| X'43'                | DFSLOG43           | ADSETLOG   | <p>The log manager or the Log Archive utility created this log record. The following subcodes identify each type of record:</p> <p><b>X'01'</b><br/>Record contains status of current online log data set. (DFSFDLS0)</p> <p><b>X'02'</b><br/>Dummy record created by Log Archive utility. This record is created as a substitute for a record that is omitted because of control statement specifications. (DFSUARPO)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|--------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'45' | DFSLOG45           | STLOGREC   | <p>Checkpoint statistics were gathered, including statistics from the 64-bit storage pool. The following subcodes within the log record mark the start of various types of statistics written in the log record (DFSSTAT0).</p> <p><b>X'01'</b><br/>Dynamic database log statistics.</p> <p><b>X'02'</b><br/>Queue buffer statistics.</p> <p><b>X'03'</b><br/>Format pool statistics.</p> <p><b>X'04'</b><br/>DL/I buffer pool statistics.</p> <p><b>X'05'</b><br/>Variable storage pool statistics.</p> <p><b>X'06'</b><br/>Application scheduling statistics.</p> <p><b>X'07'</b><br/>Logging statistics.</p> <p><b>X'08'</b><br/>VSAM buffer pool statistics.</p> <p><b>X'09'</b><br/>Program isolation statistics.</p> <p><b>X'0A'</b><br/>Latch management statistics.</p> <p><b>X'0B'</b><br/>Selected dispatcher statistics.</p> <p><b>X'0C'</b><br/>Storage pool statistics. (DFSCBT00)</p> <p><b>X'0D'</b><br/>Receive Any (RECA) Buffer statistics.</p> <p><b>X'0E'</b><br/>Fixed storage pool usage statistics.</p> <p><b>X'0F'</b><br/>Dispatcher statistics.</p> <p><b>X'10'</b><br/>RCF multi-TCB statistics.</p> <p><b>X'11'</b><br/>General storage statistics.</p> <p><b>X'12'</b><br/>IMS Storage Manager (DFSMODU0) statistics.</p> <p><b>X'15'</b><br/>64-bit Cache Manager statistics.</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type                 | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------|--------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'45'<br>(continued) | DFSLOG45           | STLOGREC   | <p><b>X'16'</b><br/>Statistics for the storage pool of the 64-bit Storage Manager. Four control blocks contain information about the Fast Path 64-bit buffer manager. The information about data bound in these control blocks is documented in the control blocks. Each control block has a starting eye catcher to identify the control blocks in the log record.</p> <ul style="list-style-type: none"> <li>• <b>DBFBPNO2:</b> Contains general information about Fast Path 64-bit buffer manager.</li> <li>• <b>DBFBPNO3:</b> Contains information about a subpool.</li> <li>• <b>DBFBPNO4:</b> Contains information about a subpool extent. The DBFBPNO4 (extent) blocks for a subpool follow the subpool block (DBFBPNO3) until the next subpool block is found.</li> <li>• <b>DBFBPNO9:</b> Contains information about all buffers of the same buffer size. All buffers for a specific buffer size are chained off this block.</li> </ul> <p><b>X'17'</b><br/>Information about user exit routines defined in the DFSDFxXX member of the IMS.PROCLIB data set. Mapped by macro DFSL4517.</p> <p><b>X'18'</b><br/>Individual TCB dispatcher statistics. Mapped by macro DFSL4518.</p> <p><b>X'19'</b><br/>Information about the pools managed by the IMS 64-bit storage manager. Mapped by macro DFSL4519.</p> <p><b>X'21'</b><br/>IRLM subsystem statistics. (DXRRSTAT)</p> <p><b>X'22'</b><br/>IRLM system statistics. (DXRRSTAT)</p> <p><b>X'FF'</b><br/>End of statistics records.</p> |
| X'47'                | DFSLOG47           | CAPLOG     | A checkpoint was just taken. This log record contains all the PSTs that were in the system. (DFSRCP10)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'48'                | DFSPALOG           | PALOGREC   | <p>This is a variable-length padding log record. A X'48' log record at the end of a block contains log block descriptive information. (DFSFLG0)</p> <p><b>X'00'</b><br/>OLDS padding X'48' record.</p> <p><b>X'01'</b><br/>X'4301' record space holder.</p> <p><b>X'02'</b><br/>Archived OLDS X'48' record.</p> <p><b>X'03'</b><br/>Batch SLDS padding X'48' record.</p> <p><b>X'04'</b><br/>Archived batch SLDS X'48' record.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'49' | DFSLOG49           | DFSLOG49   | <p>This log record is written by the log router and the full-function database tracker at the RSR tracking site when an updated block has an invalid free space element (FSE) or free space element anchor point (FSEAP).</p> <p><b>X'00'</b><br/>Definition.</p> <p><b>X'01'</b><br/>Begin stream record.</p> <p><b>X'02'</b><br/>Begin OFR record.</p> <p><b>X'03'</b><br/>OFR milestone record.</p> <p><b>X'04'</b><br/>Log truncation start record.</p> <p><b>X'05'</b><br/>XRC tracking record.</p> <p><b>X'06'</b><br/>Data set services create data set record.</p> <p><b>X'07'</b><br/>Takeover record.</p> <p><b>X'08'</b><br/>Auto Archive Init Request record.</p> <p><b>X'0A'</b><br/>Last LSN of prilog record.</p> <p><b>X'0B'</b><br/>Data set sequence number record.</p> <p><b>X'0C'</b><br/>Open data set record.</p> <p><b>X'0D'</b><br/>DBRC hash table state record.</p> <p><b>X'0E'</b><br/>FF DB Tracker Update Sequence Number (USN).</p> <p><b>X'20'</b><br/>FP DB Tracker statistics record.</p> <p><b>X'30'</b><br/>FF DB Tracker FSE Error record.</p> <p><b>X'31'</b><br/>FF DB Tracker statistics record.</p> <p><b>X'50'</b><br/>OFR Stream Processing Time.</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'4C' | DFSLOG4C           | STDBLOG    | Activity related to database processing, according to these subcodes:<br><b>X'01'</b><br>A backout for token was done. (DFSRBOIO)<br><b>X'02'</b><br>A backout error occurred. (DFSRBOIO)<br><b>X'04'</b><br>First update flag was reset. (DFSDBDR0)<br><b>X'08'</b><br>A share level or held state was changed. (DFSDBAU0, DFSDL0C0)<br><b>X'10'</b><br>A write error occurred. (DFSDBH40, DFSDVSM0)<br><b>X'20'</b><br>A program was stopped. (DFSRBOIO)<br><b>X'40'</b><br>A database was started. (DFSDBDR0)<br><b>X'80'</b><br>A database was stopped. (DFSDBDR0)<br><b>X'82'</b><br>A database backout failure occurred. (DFSRESPO) |
| X'4E' | DFSLOG4E           | DFSLOG4E   | An event occurred during monitoring. This record is in the monitor log and contains statistical information about the system. (DFSMNTR0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| X'50' | DFSDLOG            | DLOGDB     | The database was updated. This log record contains the new data on an insert and update call as well as the old data and FSE updates on a delete call. (DFSRDBLO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X'52' | DFSDLOG            | DLOGDB     | IMS is about to do an ISRT operation for a new root in a key sequence data set. This record contains a copy of the data before it was changed. (DFSRDBLO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| X'53' | DFSLOG53           | SPLLOG     | Bitmap is written for a log record for an alternate IMS that is tracking a CI split on an active IMS. (DFSRCHB0, DFSGGSP0, DFSFRSP0, DFSDVSM0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| X'55' | DFSETPCP           | DFSETPCP   | Record reserved for external subsystem information. (DFSESS30)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------|--------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'56' | DFSETPCP           | DFSETPCP   | <p>IMS external subsystem support recovery log record ID. The following subcodes, contained within the record, precede information in the log record. X'56' records are written by three IMS components. These components can represent the status of IMS external subsystem transactions, the status of the connection between IMS and the CCTL, or the stages of IMS sync point processing. The subcodes listed below represent the X'56' record components and their purposes. The subcodes are contained in the record and precede data in the log record.</p> <p><b>X'000001'</b><br/>IMS began the commit process. (DFSESP10)</p> <p><b>X'000002'</b><br/>IMS finished the commit process. (DFSESP20)</p> <p><b>X'000003'</b><br/>IMS signed on to an external subsystem. (DFSESS00)</p> <p><b>X'000004'</b><br/>IMS created a thread for external subsystem. (DFSESCT0)</p> <p><b>X'000005'</b><br/>IMS resolved an in-doubt transaction. (DFSESI60)</p> <p><b>X'000006'</b><br/>An IMS dependent region abended. (DFSFESP0)</p> <p><b>X'000007'</b><br/>IMS deleted a residual recovery element (RRE) through the <b>/CHA</b> command. (DFSESI70)</p> <p><b>X'000008'</b><br/>IMS deleted a residual recovery element (RRE) by a restart or start command. (DFSIESIO)</p> <p><b>X'000009'</b><br/>An external subsystem disconnected. (DFSESI30)</p> <p><b>X'00000A'</b><br/>Commit found no work to do.</p> <p><b>X'08'</b><br/>A CCTL connected to DBCTL. (DFSDASIO) Mapping macro is DFSETPCP.</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type                 | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'56'<br>(continued) | DFSETPCP           | DFSETPCP   | <p><b>X'09'</b><br/>A CCTL disconnected from DBCTL. (DFSDASD0) Mapping macro is DFSETPCP.</p> <p><b>X'10'</b><br/>Phase 1 commit processing started. (DFSDSC00, DFSTMS00)</p> <p><b>X'11'</b><br/>Phase 1 commit processing ended. (DFSDSC00, DFSTMS00)</p> <p><b>X'12'</b><br/>Phase 2 commit processing ended. (DFSDSC00, DFSFXC30, DFSSMSC0, DFSTMS00)</p> <p><b>X'13'</b><br/>Recoverable in-doubt structure (RIS) created. (DFSDRIS0)</p> <p><b>X'14'</b><br/>Recoverable in-doubt structure (RIS) deleted. (DFSDRID0)</p> <p><b>X'15'</b><br/>IMS restarted with z/OS Resource Recovery Services. (DFSRRSI0)</p> <p><b>X'16'</b><br/>Interest has been registered with RRS for this UOW. (DFSRRSI0)</p> <p><b>X'37'</b><br/>Phase 2 commit processing started by a resynchronization request. (DFSDRID0)</p> <p><b>X'38'</b><br/>Phase 2 abort processing started by a resynchronization request. (DFSDRID0)</p> <p><b>X'FA'</b><br/>Transaction-level statistics. (DFSDSC00, DFSFXC30, DFSTMS00)</p> |
| X'57'                | DFSDBUR            | DFSDBUR    | <p>Database updates in an RSR environment:</p> <p><b>X'01'</b><br/>Begin database update. (DFSRDBL0)</p> <p><b>X'02'</b><br/>End database update. (DFSRDBL0)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| X'59'                | DBFL59X            | L59X       | <p><b>X'10'</b><br/>I/O from a data space has started (DBFVXOC0, DBFVOCIO)</p> <p><b>X'12'</b><br/>A group of CIs (control intervals) from a data space has been written to DASD (DBFVXOC0, DBFVOCIO, DBFERS21)</p> <p><b>X'45'</b><br/>Contains information about buffer use and buffer waits (using FP 64 bit buffer manager) for each UOW).</p> <p><b>X'60'</b><br/>Records all creations, expansions, and compressions of the subpools.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type                 | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                          |
|----------------------|--------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'59'<br>(continued) | DBFLS9FF           | L59FF      | <p><b>X'51'</b><br/>To indicate that nonrecoverable suppression has taken place.</p> <p><b>X'FF'</b><br/>To track internal IMS FP information in various modules.</p> <p><b>Mapping Macro</b><br/>This is a Fast Path log record.<br/>The following subcodes, contained within the record, precede information in the log record:</p> |
|                      | DBFLGRIM           | FLIM       | <p><b>X'01'</b><br/>An input message was received. (DBFSHSP0)</p>                                                                                                                                                                                                                                                                     |
|                      | DBFLGROM           | FLOM       | <p><b>X'03'</b><br/>An output message was sent. (DBFSHSP0)</p>                                                                                                                                                                                                                                                                        |
|                      | DBFSQRIM           | DBFSQRIM   | <p><b>X'11'</b><br/>An input message was inserted on an EMHQ structure. (DBFHIEL0, DBFSYN20)</p>                                                                                                                                                                                                                                      |
|                      | DBFSQROM           | DBFSQROM   | <p><b>X'16'</b><br/>An output message was inserted on an EMHQ structure. (DBFATRM0, DBFHCTR0, DBFHCAS0, DBFERMG0, DBFSYN20)</p>                                                                                                                                                                                                       |
|                      | DBFBMSDB           | MSUPLOG    | <p><b>X'20'</b><br/>An MSDB was updated. (DBFSLOG0, DBFBMSDB)</p>                                                                                                                                                                                                                                                                     |
|                      | DBFDOCL            | DOCL       | <p><b>X'21'</b><br/>DEDB area data set was opened. (DBFMOCL0)</p> <p><b>X'22'</b><br/>DEDB area data set was closed. (DBFMOCL0)</p> <p><b>X'23'</b><br/>DEDB area data set status was changed. (DBFMOCL0)</p>                                                                                                                         |
|                      | DBFEQE             | EQE        | <p><b>X'24'</b><br/>An ADS error queue element (EQE) was created. (DBFMEQE0)</p>                                                                                                                                                                                                                                                      |
|                      | DBFLGRDQ           | FLDQ       | <p><b>X'36'</b><br/>An output message was dequeued. This log record also contains information that is necessary to run the Fast Path Log Analysis utility in a shared EMH environment. (DBFHQMIO, DBFHTMG0)</p>                                                                                                                       |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type              | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                             |
|-------------------|--------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'59'<br>(cont'd) | DBFLGSYN           | SYNC       | <b>X'37'</b><br>A synchronization point operation completed. (DBFSLG20)<br><b>X'38'</b><br>A synchronization point operation was unsuccessful. (DBFSLG20)                                                                                                                                                                |
|                   | DBFLGRIC           | HICL5947   | <b>X'47'</b><br>Contains a bit map of CIs that have updates in an HSSP image copy data set. (DBFSLGE1)                                                                                                                                                                                                                   |
|                   | DBFLSRT            | LSRT       | <b>X'50'</b><br>A DEDB was updated—DMAC status log record for DMACOCNT or DMACNXTS. (DBFSLOG0, DBFARDB0, DBFMLOPO)<br><b>X'53'</b><br>An online utility updated a DEDB. (DBFUMALO, DBFUMAI0)<br><b>X'54'</b><br>A log record is created each time an area containing sequential dependent buffers was opened. (DBFMLOG0) |
|                   | DBFLFRSD           | FLSD       | <b>X'55'</b><br>A new buffer for sequential dependent segments was obtained. (DBFSYP20)                                                                                                                                                                                                                                  |
|                   | DBFLSRT            | LSRT       | <b>X'56'</b><br>Indoubt SDEP buffer from the resynchronization process. (DBFMLOG0) (DBFSYP20)<br><b>X'57'</b><br>Local/Global portion of DMAC logged. (DBFARDB0, DBFUMALO)                                                                                                                                               |
|                   | DBFL56X            | L56X       | <b>X'58'</b><br>An SDEP buffer was successfully written. (DBFSYP20)                                                                                                                                                                                                                                                      |
|                   | DBFLGRDA           | LGRDA      | <b>X'61'</b><br>DEDB Alter log records.                                                                                                                                                                                                                                                                                  |
|                   | DBFLGRRE           | FLRE       | <b>X'70'</b><br>The MSDB relocation factor for XRF is shown. (DFSRLP00)                                                                                                                                                                                                                                                  |
|                   | X'5E'              | DFSLOG5E   | SBLI                                                                                                                                                                                                                                                                                                                     |



Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|--------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'5F' | DFSLOG5F           | DLTRLOGR   | A DL/I call was completed. This record contains DL/I call image capture trace data. (DFSDDLTO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| X'63' | LOGCSQ             | S3REC63    | Log session initiation and termination. When X'02' is on in the second byte, the X'63' record represents only the deletion of a VTCB. (DFSCVLG0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| X'64' | DFSMSREC           | SMREC      | An inconsistency was found in processing associated with MSC. (DFSCMS00)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| X'65' | DFSLOG65           | SSREC      | A message is about to be enqueued. (DFSCRSV0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| X'66' | LOG3600            | SXREC      | A message is about to be enqueued or dequeued (applicable for 3614, FINANCE, and SLU P nodes, MSC links, or ISC sessions). (DFSCVFDO, DFSCVF10, DFSCVFNO, DFSCVLG0, DFSCMSV0, DFSCMSF0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| X'67' | DFSL6701           | CTLDESC    | <p>This log record is a service trace record. The following subcodes, contained within it, identify what conditions caused a particular part of the log record to be written:</p> <p><b>X'01'</b><br/>           There are three situations in which X'6701' is written:</p> <ul style="list-style-type: none"> <li>• A <b>/TRACE</b> command was issued. This record can also indicate that error blocks were written unconditionally by device-dependent code when a major error condition was detected (DFSCFEZ0).</li> <li>• Errors were detected in AOI module DFSAOUE0.</li> <li>• Errors were detected in DFSAOE00 or another AOIE type exit routine.</li> </ul> <p><b>X'03'</b><br/>           A 3270 error was detected. More information about this condition is contained in <a href="#">“Terminal communication task trace”</a> on page 269. (DFSCFEZ0)</p> <p><b>X'04'</b><br/>           An IMS notification exit failed to obtain an AWE for restart processing. IMS was unable to post the deferred unit of recovery with z/OS Resource Recovery Services.</p> <p><b>X'06'</b><br/>           A normal record that is generated when a Fast Path region ends abnormally.</p> |
| X'67' |                    |            | <p><b>X'05'</b><br/>           A thread terminated abnormally. The data portion of the log record contains diagnostic information for dependent regions. (Note that data that is contained in the DTRM work area of the XPST block, such as the abend code, might be residual data from a previous abnormal termination in the same region.) All blocks logged have eye catchers preceding them. Normal IMS DSECTs map the logged information. (DFSASK00, DFSDTTA0, DFSSDA20)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| X'67' | DFSL6701           | CTREC      | <p><b>X'07'</b><br/>           An HSSP PCB is repositioned backward rather than to the next UOW. The control blocks EPST, EPCB, and SPCB are snapped in this log record for diagnostic purposes. (DBFSHDQ0)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------|--------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'67' | DFSL6740           | DFS6740    | <p><b>X'40'</b></p> <p>This log record represents an IMS UOW that was placed on the Common Queue Server's (CQS) cold queue because CQS found UOWs on its private queues on a cold start of either TM (COLDSYS or COLDCOMM) or CQS. CQS moves these UOWs to the CQS cold queue and passes the UOW values to IMS. IMS logs these UOWs in the type X'6740' log record for audit purposes. The customer can then process these log records to determine what action to take for these UOWs. (DFSSQ030, DBFSQ030)</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------|--------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'67' | DFS67D0            | DFS67D0    | <p><b>X'D0'</b><br/>Indicates the diagnostic record of a failed service request.</p> <p><b>X'01'</b><br/>Failure during a DB DL/I call.</p> <p><b>X'02'</b><br/>Failure during a DC DL/I call. (DFSCPY00, DFSDLA30, DBFHGU10, DFSTMAPO)</p> <p><b>X'03'</b><br/>Failure during a SYS DL/I call.</p> <p><b>X'04'</b><br/>An exit failure occurred. (DFSRRSIO)</p> <p><b>X'05'</b><br/>Failure during SPOOL API processing. (DFSIAFP0)</p> <p><b>X'06'</b><br/>Failure during Transaction Manager schedule processing. (DFSTMAS0, DFSTMCD0)</p> <p><b>X'07'</b><br/>Failure during Service Logical Unit Manager (SLUM) processing.</p> <p><b>X'08'</b><br/>Failure during Asynchronous Logical Unit Manager (ALUM) processing.</p> <p><b>X'09'</b><br/>Failure during coupling facility processing. (DFSDCFR0, DFSDMAW0)</p> <p><b>X'0A'</b><br/>Failure during queue manager processing.</p> <p><b>X'0B'</b><br/>Failure during shared queues interface processing. (DBFIPQS0, DFSITQS0, DBFILQS0, DFSILQS0)</p> <p><b>X'0C'</b><br/>Failure during NDM user exit interface processing. (DFSNDMIO)</p> <p><b>X'0D'</b><br/>Failure during shared queues CQSINFRM processing.</p> <p><b>X'0E'</b><br/>Failure during shared queues request processing. (DBFHCAS0, DBFHGU10, DBFHSQS0)</p> <p><b>X'0F'</b><br/>Failure during UOWE resync processing. (DBFHGU10, DBFHCAS0)</p> <p><b>X'10'</b><br/>Shared EMH z/OS cross-system coupling facility communication error. (DBFHXCS0)</p> <p><b>X'11'</b><br/>An unsolicited output message was detected. (DBFHSQS0)</p> <p><b>X'12'</b><br/>In-flight input message deleted. (DBFHCAS0)</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type              | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|--------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'67'<br>(cont'd) | DFS67D0            | DFS67D0    | <p><b>X'13'</b><br/>Fast Path Queue Manager Diagnostics. (DBFHQMI0)</p> <p><b>X'14'</b><br/>System Termination Diagnostics. (DFSSDA20, DFSTRM00)</p> <p><b>X'15'</b><br/>System Service Error. (DFSOCMD0)</p> <p><b>X'16'</b><br/>Unexpected return or reason code from RM, OM, SCI, or CQS request.</p> <p><b>X'17'</b><br/>Failure during RM update, query, or delete processing.</p> <p><b>X'19'</b><br/>VSAM JRNAD ERROR. (DFSDVSM0)</p> <p><b>X'1A'</b><br/>Sysplex Serial Program Manager (SSPM) encountered an error.</p> <p><b>X'1B'</b><br/>Abend U3310 or statusBD caused by an IRLM long lock timeout</p>                                                                                                                                                                                                                                                                                                                                                                                                                |
| X'67'             | DFSL67FD           | SNELDESC   | <p><b>X'ED'</b><br/>Sequential buffering SNAP, created during a periodic evaluation of the sequential buffering process by the SBESNAP option. (DFSSBSN0)</p> <p><b>X'EE'</b><br/>SNAP of a call to the sequential buffering buffer-handler created by the SBSNAP option. (DFSSBSN0)</p> <p><b>X'EF'</b><br/>SNAP created when the sequential buffering COMPARE option detects a mismatch between the results of a call to the buffer handler and the DASD block as stored on DASD. (DFSSBSN0)</p> <p><b>X'FB'</b><br/>An invalid AWE was detected. Some of the possible causes of the invalid AWE include conflicting parameters, missing addresses or bad pointers. The log record indicates which of the processing modules detected the invalid AWE.</p> <p><b>X'FD'</b><br/>A SNAP call was issued. (DFSERA20)</p> <p><b>X'FF'</b><br/>A pseudoabend or dependent region abnormal termination occurred. Further information of this condition is contained in <a href="#">“SNAP call facility” on page 618</a>. (DFSERA20)</p> |
| X'67'             | DFSL67FA           | DFSTRHD    | <p><b>X'FA'</b><br/>Contains images of the in memory trace tables. These tables are written to the log when requested by the OPTIONS statement in the VSPEC=parameter member or the <b>/TRACE</b> command. (DFSTRA20)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'69'             | DFSLOG69           | JM         | <p>An unauthorized 3275 terminal dialed into a line specified as VERIFY=YES. (DFSDS060)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X'6C'             | DFSMSCRC           | CMSCREC    | <p>MSC partner systems were started. (DFSCMSW0)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|--------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'6D' | DFSLOG6D           | SURVLOG    | <p>This log record is used in an XRF environment when:</p> <ul style="list-style-type: none"> <li>• XRF surveillance was started or stopped.</li> <li>• A write error occurred on the active subsystem.</li> <li>• The interval or timeout values on the active subsystem were changed by a <b>/CHANGE</b> command. (DFSHIC40, DFSHSRV0, DFSISL60)</li> </ul> <p><b>X'04'</b><br/>Fast DB recovery creates this log record to indicate which TASK or ITASK received a TIMEOUT or is in a wait or loop for more than one second.</p> <p><b>X'40'</b><br/>Diagnostic information for FDR. This record is written without any data in a one-second interval to the log.</p> |
| X'6E' | DFSLOG6E           | LUMLOG     | <p>One of the following SNA commands was processed: QEC, QC, RELQ, RSHUT, SHUTD, SHUTC, LUS. (DFSHCLG0)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------|--------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'70' | DFSLOG70           | OLCREC     | <p><b>X'00'</b><br/>An online change <b>/MODIFY</b> command sequence completed successfully. The IMS.MODSTAT data set is being updated. (DFSICV80)</p> <p><b>X'01'</b><br/>Allows the XRF primary to signal the alternate that the transaction has been stopped (PSTOP) by module DFSSMSC0. (DFSICV90)</p> <p><b>X'02'</b><br/>Begin write of the new versions of the updated members log record. The log records will contain the names of all the members that are affected by the member online change. If more member names exist than can fit in one X'7002' log record, multiple X'7002' log records are logged.</p> <p><b>X'03'</b><br/>Write complete ACB library member online change log record.</p> <p><b>X'04'</b><br/>Commit start ACB library member online change log record.</p> <p><b>X'05'</b><br/>Commit complete ACB library member online change log record.</p> <p><b>X'06'</b><br/>Restart abort ACB library member online change record.</p> <p><b>X'07'</b><br/>Begin update of the staging data set to delete members already committed log record.</p> <p><b>X'08'</b><br/>Complete update of the staging data set to delete members already committed log record.</p> <p><b>X'12'</b><br/>Begin rename old directory version catalog import/DDI activation log record.</p> <p><b>X'13'</b><br/>End rename old directory version catalog import/DDI activation log record.</p> <p><b>X'14'</b><br/>Begin delete old directory version catalog import/DDI activation log record.</p> <p><b>X'15'</b><br/>End delete old directory version catalog import/DDI activation log record.</p> <p><b>X'29'</b><br/>Prepare phase has locked the OLCSTAT data set log record.</p> <p><b>X'30'</b><br/>Commit phase before it attempts to update the OLCSTAT data set log record.</p> <p><b>X'31'</b><br/>Commit phase after it attempted to update the OLCSTAT data set log record.</p> <p><b>X'32'</b><br/>Commit phase or terminate phase after unlocking the OLCSTAT data set log record.</p> <p><b>X'40'</b><br/>Cleanup to abort import/DDI activation with no updates to directory log record.</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type              | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|--------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'70'<br>(cont'd) | DFSLOG70           | OLCREC     | <p><b>X'44'</b><br/>Cleanup at abort phase 2 to end delete new directory version catalog import/DDL activation log record.</p> <p><b>X'45'</b><br/>Cleanup at abort phase 2 to rename directory member catalog import/DDL activation log record.</p> <p><b>X'46'</b><br/>Cleanup at abort phase 3 to start delete new directory version catalog import/DDL activation log record.</p> <p><b>X'47'</b><br/>Cleanup at abort phase 3 to end delete new directory version catalog import/DDL activation log record.</p> <p><b>X'48'</b><br/>Cleanup at abort phase 3 to start rename directory member catalog import/DDL activation log record.</p> <p><b>X'49'</b><br/>Cleanup at abort phase 3 to end rename directory member catalog import/DDL activation log record.</p> <p><b>X'4A'</b><br/>Cleanup at commit to start delete old directory version catalog import/DDL activation log record.</p> <p><b>X'4B'</b><br/>Cleanup at commit to end delete old directory version catalog import/DDL activation log record.</p> <p><b>X'4C'</b><br/>Cleanup at commit to update online change timestamp catalog import/DDL activation log record.</p> <p><b>X'4D'</b><br/>Cleanup at commit to delete staging members catalog import/DDL activation log record.</p> <p><b>X'4E'</b><br/>Cleanup at abort phase complete import/DDL activation log record.</p> <p><b>X'50'</b><br/>Cleanup at commit to delete directory work members log import/DDL activation log record.</p> <p><b>X'51'</b><br/>Cleanup at commit phase complete import/DDL activation log record.</p> |

Table 220. IMS log records used to analyze IMS problems (continued)

| Type  | Mapping macro name | DSECT name | Why written (issuing module)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|--------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'72' | DFSLOG72           | USRREC     | <p>Used by dynamic terminals during sign on create, sign off delete, and sign on modification. The following subcodes identify the conditions that caused a particular log record to be written and the content of the log record:</p> <p><b>X'01'</b><br/>ETO user structure dynamically created. Contains the SPQB name and one or more CNTs.</p> <p><b>X'02'</b><br/>ETO user structure dynamically deleted. Contains only the SPQB name.</p> <p><b>X'03'</b><br/>ETO user structure modified. Contains the SPQB name and one or more CNTs.</p> <p><b>X'04'</b><br/>One or more CNTs added to an ETO user structure. Contains the SPQB name and the CNTs that were added.</p> <p><b>X'06'</b><br/>Dynamic logical link block (LNB) created.</p> <p><b>X'07'</b><br/>Transaction SMB changed by shared queues SID exchange.</p> <p><b>X'08'</b><br/>TPIPE for OTMA in an XRF environment deleted.</p> |
| X'99' | DFSDXBLK           | DFSDXBLK   | <p>Created by the logging option on the EXIT= parameter on the DBDGEN. This allows a user to capture database changes that can then be propagated to another environment (for example, Db2 for z/OS). The subcodes indicate the type of record being logged:</p> <p><b>X'04'</b><br/>Changed data</p> <p><b>X'28'</b><br/>End of job (EOJ)</p> <p><b>X'30'</b><br/>SETS call</p> <p><b>X'34'</b><br/>ROLS call</p> <p>This log record is mapped by the macro, DFSDXBLK, which is not shipped.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |

**Related concepts**

[“Determining a value for the LOCKMAX parameter” on page 214](#)

To decide what value to use for the LOCKMAX parameter, analyze over a period of time the X'37', X'41', and X'5937' commit log records to determine the maximum number of locks being held per unit of work by the application.

**Related reference**

[“X'4930': database tracker FSE error log record format” on page 513](#)

The log record layout for X'4930' is described with offset and length.

[“Terminal communication task trace” on page 269](#)



When an output device (such as a terminal, line, or node) hangs, you can use the terminal communication task trace to diagnose the problem.

[“SNAP call facility” on page 618](#)

The SNAP call facility (DFSERA20) produces SNAP dumps of DL/I control blocks and identifies calling routines that generate SNAP dumps. Supervisor call (SVC) dumps are generated only for the intended abend codes or status codes, and for unknown calling routines.

[“DEDB control interval \(CI\) problem assistance aids” on page 395](#)

When you print portions of the DEDB, the control intervals (CIs) have these identifying characteristics.

## Format of X'29' log record

The format of the X'29' log records, including offset (ex.), length, field name, and field description are listed.

### X'2900': OLR command received

A X'2900' log record is written to indicate the receipt of a HALDB OLR command.

Only one X'2900' log record is written for each command. The following table describes the layout of the X'2900' log record.

Table 221. X'2900' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                           |
|---------------|------------------|------------|-----------------------------------------------------------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number                                                  |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                                                                            |
| 04            | 1                | HORATYPE   | X'29' Record type                                                                                                           |
| 05            | 1                | HORATYPE   | X'00' Record sub-type                                                                                                       |
| 06            | 2                | HORRSV2    | X'0000' Reserved                                                                                                            |
| 08            | 8                | HORRENM    | RSE name or IMS ID                                                                                                          |
| 10            | 16               | HOROMCT    | OM command token if from a type-2 command, or zeros if from a type-1 command                                                |
| 20            | 1                | HORATYPE   | Command type flags:<br>"1000 . . . ." INITIATE<br>"0100 . . . ." UPDATE<br>"0010 . . . ." QUERY<br>"0001 . . . ." TERMINATE |
| 21            |                  | HOROCMD    | OM command instance block (OCMD) if from a type-2 command, or zeros if from a type-1 command                                |

### X'2910': ownership established

Ownership of the online reorganization for a partition was established through DBRC.

The following table describes the X'2910' log record layout.

Table 222. X'2910' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 04            | 1                | HORTYPE    | X'29' Record type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 05            | 1                | HORSTYPE   | X'10' Record sub-type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 06            | 2                | HORPSTNO   | PST number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 08            | 8                | HORSENM    | RSE name or IMS ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 10            | 8                | HORDBD     | DBD name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 18            | 8                | HORPSB     | PSB name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 18            | 1                | HORPSB0    | C'0'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 20            | 1                | HOROFLG1   | Flag bit definitions:<br><b>B'10.. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(NODEL)</b><br><b>B'01.. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with or defaulted to <b>OPTION(DEL)</b><br><b>B'..1. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with the <b>RATE</b> option<br><b>B'...0 ....'</b><br>A new reorganization started<br><b>B'...1 ....'</b><br>The reorganization restarted<br><b>B'.... .0..'</b><br>The database is not covered by RSR<br><b>B'.... .1..'</b><br>The database is covered by RSR<br><b>B'.... ..1.'</b><br>The <b>INITIATE OLREORG</b> command was issued with or defaulted to <b>OPTION(NOREL)</b><br><b>B'.... ...1'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(REL)</b> |
| 21            | 1                | HORORATEV  | RATE value (1 through 100 percent)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**X'2911': conditional ownership established**

An attempt to establish ownership of OLR in the RECON will be made. The ownership may or may not be recorded in the RECON for this partition. When OLR has established ownership, this log record contains

the data set retention (DEL/NODEL/REL/NOREL) and rate options specified on the INIT OLREORG command.

The following table describes the X'2911' log record layout.

Table 223. X'2911' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number                                                                                                                                                                                                                                                                                                                                                    |
| 02            | 2                | HORRSV1    | X'0000'                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 04            | 1                | HORTYPE    | X'29' Record type                                                                                                                                                                                                                                                                                                                                                                                                             |
| 05            | 1                | HORSTYPE   | X'10' Record sub-type                                                                                                                                                                                                                                                                                                                                                                                                         |
| 06            | 2                | HORPSTNO   | PST number                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 08            | 8                | HORSENM    | RSE name or IMS ID                                                                                                                                                                                                                                                                                                                                                                                                            |
| 10            | 8                | HORDBD     | DBD name                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 18            | 8                | HORPSB     | PSB name                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 18            | 1                | HORPSB0    | C'0'                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                                                                                                                                                                                                                |
| 20            | 1                | HORCOFLG1  | Flag bit definitions:<br><b>B'10.. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(NODEL)</b><br><b>B'01.. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(DEL)</b><br><b>B'..1. ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(NOREL)</b><br><b>B'...1 ....'</b><br>The <b>INITIATE OLREORG</b> command was issued with <b>OPTION(REL)</b> |
| 21            | 1                | HORCORATEV | RATE value                                                                                                                                                                                                                                                                                                                                                                                                                    |

**X'2920': UPDATE OLREORG command**

The UPDATE OLREORG command was processed. The X'2920' log record is written once for each HALDB partition affected by the UPDATE OLREORG command.

The following table describes the X'2920' log record layout.

Table 224. X'2920' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                           |
|---------------|------------------|------------|-----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number. |
| 02            | 2                | HORRSV1    | X'0000' Reserved.                                                           |

Table 224. X'2920' log record layout (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                      |
|---------------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04            | 1                | HORTYPE    | X'29' Record type.                                                                                                                                                                                                                                     |
| 05            | 1                | HORSTYPE   | X'20' Record sub-type.                                                                                                                                                                                                                                 |
| 06            | 2                | HORPSTNO   | PST number.                                                                                                                                                                                                                                            |
| 08            | 8                | HORRSENM   | RSE name or IMS ID.                                                                                                                                                                                                                                    |
| 10            | 8                | HORDBD     | DBD name.                                                                                                                                                                                                                                              |
| 18            | 8                | HORPSB     | PSB name.                                                                                                                                                                                                                                              |
| 18            | 1                | HORPSB0    | C'0'                                                                                                                                                                                                                                                   |
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                                         |
| 20            | 1                | HORUFLG1   | Flags:<br><b>B'10.. ....'</b><br>The NODEL option is now in effect.<br><b>B'01.. ....'</b><br>The DEL option is now in effect.<br><b>B'..1. ....'</b><br>The NOREL option is now in effect.<br><b>B'...1 ....'</b><br>The REL option is now in effect. |
| 21            | 1                | HORURATEV  | RATE value (1 through 100 percent) that is now in effect.                                                                                                                                                                                              |

**X'2930': output data set information**

The output data sets have been successfully validated or created. This X'2930' log record contains various characteristics of all of the output data sets, both those that were preexisting and those that were automatically created.

There is enough information to recreate any of these output data sets. The following table describes the X'2930' log record layout.

Table 225. X'2930' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                           |
|---------------|------------------|------------|-----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number. |
| 02            | 2                | HORRSV1    | X'0000' Reserved.                                                           |
| 04            | 1                | HORTYPE    | X'29' Record type.                                                          |
| 05            | 1                | HORSTYPE   | X'30' Record sub-type.                                                      |
| 06            | 2                | HORPSTNO   | PST number.                                                                 |
| 08            | 8                | HORRSENM1  | RSE name or IMS ID.                                                         |
| 10            | 8                | HORDBD     | DBD name.                                                                   |
| 18            | 8                | HORPSB     | PSB name.                                                                   |

Table 225. X'2930' log record layout (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                             |
|---------------|------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18            | 1                | HORPSBO    | C'0'                                                                                                                                                                                                                                                                                                                                          |
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                                                                                                                                |
| 20            | 4                | HORDUSN    | Update sequence number (USN).                                                                                                                                                                                                                                                                                                                 |
| 24            | 4                | HORDUSID   | Update set ID (USID).                                                                                                                                                                                                                                                                                                                         |
| 28            | 1                | HORDFLG1   | Flags:<br>". . . . .0. ."<br>The database is not RSR covered.<br>". . . . .1. ."<br>The database is RSR covered.<br>". . . . .0."<br>The A-thru-J and X data sets are the output data sets.<br>". . . . .1."<br>The M-thru-V and Y data sets are the output data sets.<br>". . . . .0"<br>PHDAM database.<br>". . . . .1"<br>PHIDAM database. |
| 29            | 1                | HORDDSECT  | Number of following entries.                                                                                                                                                                                                                                                                                                                  |
| 2A            |                  | HORDDSE    | The group of fields shown in Table 226 on page 543 is repeated for each output data set. There are two entries for the primary index data set of a PHIDAM database.                                                                                                                                                                           |

The group of fields shown in the following table is repeated for each output data set. There are two entries for the primary index data set of a PHIDAM database.

Table 226. X'2930' log record layout – repeated data set fields

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                     |
|---------------|------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00            | 2                | HORDENTL   | Entry length, including this length field.                                                                                                                                                            |
| 04            | 1                | HORDUCBDCL | UCB device class.                                                                                                                                                                                     |
| 05            | 1                | HORDUCBDCC | UCB device class.                                                                                                                                                                                     |
| 06            | 1                | HORDDCBN   | DCB number, with A-thru-J, X or M-thru-V, Y indicator:<br>"0. . . . ."<br>One of the A-thru-J or X data sets.<br>"1. . . . ."<br>One of the M-thru-V or Y data sets.<br>". . . . nnnn"<br>DCB number. |
| 07            | 8                | HORDDNAM   | The DD name used for allocation.                                                                                                                                                                      |

Table 226. X'2930' log record layout – repeated data set fields (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0F            | 1                | HORDDFL1   | <p>Data set flags:</p> <p>"0... .."</p> <p>OSAM data set.</p> <p>"1... .."</p> <p>VSAM data set.</p> <p>".0.. .."</p> <p>Data set existed before INITIATE OLREORG command.</p> <p>".1.. .."</p> <p>Data set was created automatically.</p> <p>".0. ...."</p> <p>Non-SMS-managed data set.</p> <p>".1. ...."</p> <p>SMS-managed data set.</p> <p>"1..0 ...."</p> <p>VSAM ESDS.</p> <p>"1..1 0..."</p> <p>VSAM KSDS data component (DCB number X'05' or X'85').</p> <p>"1..1 1..."</p> <p>VSAM KSDS index component (DCB number X'04' or X'84').</p> <p>". . . . .0.."</p> <p>NOREPLICATE. Do not replicate index records (or replication not applicable).</p> |
| 10            | 1                | HORDDFL2   | <p>Data set space allocation flags for Input data set primary space allocation unit</p> <p>"1000 ...."</p> <p>Records (VSAM) or blocks (OSAM).</p> <p>"0100 ...."</p> <p>Bytes</p> <p>"0010 ...."</p> <p>Kilobytes.</p> <p>". . . . 0001"</p> <p>Megabytes.</p> <p>". . . . 1000"</p> <p>Cylinders</p> <p>". . . . 0100"</p> <p>Tracks</p>                                                                                                                                                                                                                                                                                                                   |

Table 226. X'2930' log record layout – repeated data set fields (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                               |
|---------------|------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11            | 1                | HORDDFL3   | Data set space allocation flags for Input data set secondary space allocation unit:<br><b>"1000...."</b><br>Records (VSAM) or blocks (OSAM)<br><b>"0100...."</b><br>Bytes<br><b>"0010...."</b><br>Kilobytes<br><b>"....00001"</b><br>Megabytes<br><b>"....1000"</b><br>Cylinders<br><b>"....0100"</b><br>Tracks |
| 12            | 4                | HORDRCSZ   | VSAM record size or OSAM block size.                                                                                                                                                                                                                                                                            |
| 16            | 4                | HORDCISZ   | For VSAM, control interval size. For OSAM: 0.                                                                                                                                                                                                                                                                   |
| 1A            | 8                | HORDDATC   | For SMS-managed, data class if present. Otherwise, blanks.                                                                                                                                                                                                                                                      |
| 22            | 8                | HORDSTGC   | For SMS-managed, storage class. Otherwise, blanks.                                                                                                                                                                                                                                                              |
| 2A            | 8                | HORDMGTC   | For SMS-managed, management class if present. Otherwise, blanks.                                                                                                                                                                                                                                                |
| 32            | 4                | HORDPRIA   | Primary allocation amount. See HORDDFL2.                                                                                                                                                                                                                                                                        |
| 36            | 4                | HORDPRIACV | Primary space converted amount in blocks/records/megabytes.                                                                                                                                                                                                                                                     |
| 3A            | 4                | HORDSECA   | Secondary allocation amount. See HORDDFL2.                                                                                                                                                                                                                                                                      |
| 3E            | 4                | HORDSECACV | Secondary space converted amount in blocks/records/megabytes.                                                                                                                                                                                                                                                   |
| 42            | 1                | HORDFSCI   | For VSAM KSDS data component, free space percentage in each control interval.                                                                                                                                                                                                                                   |
| 43            | 1                | HORDFSCA   | For VSAM KSDS data component, free space percentage in each control area.                                                                                                                                                                                                                                       |
| 44            | 1                | HORDKYLN   | For VSAM KSDS data component, key length.                                                                                                                                                                                                                                                                       |
| 45            | 2                | HORDKYOF   | For VSAM KSDS data component, key offset.                                                                                                                                                                                                                                                                       |
| 47            | 1                | HORDSHRR   | For VSAM, SHAREOPTIONS value, cross-region.                                                                                                                                                                                                                                                                     |
| 48            | 1                | HORDSHRS   | For VSAM, SHAREOPTIONS value, cross-system.                                                                                                                                                                                                                                                                     |
| 49            | 1                | HORDVOLR   | Number of existing or requested DASD volumes.                                                                                                                                                                                                                                                                   |
| 4A            | 1                | HORDVOLC   | Number of volume serial numbers following.                                                                                                                                                                                                                                                                      |
| 4B            | <i>n</i>         | HORDVOLS   | Volume serial numbers.                                                                                                                                                                                                                                                                                          |
| 4C            | 6                | HORDVOL    | Volume serial number (repeated). HORDVOLC contains the number of these volume serial number entries.                                                                                                                                                                                                            |

**X'2931': conditional output data set information**

The type X'2931' log record contains conditional output data set information based on the contents of the 2930 log record.

The output data sets have been successfully validated or created but the OLR start time has not been set and Cursor Active has not been set in the RECON. The 2931 log record is a copy of the 2930 log record and contains the same information as the 2930 except for the USID and the USN which are excluded.

**X'2940': cursor-active status set**

The cursor is active. Initialization of the reorganization of the partition was completed successfully, two sets of data sets exist, and copying is about to begin. The reorganization was recorded through DBRC as being in a cursor-active status.

The following table describes the X'2940' log record layout.

Table 227. X'2940' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                          |
|---------------|------------------|------------|----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                           |
| 04            | 1                | HORATYPE   | X'29' Record type                                                          |
| 05            | 1                | HORATYPE   | X'40' Record sub-type                                                      |
| 06            | 2                | HORPSTNO   | PST number                                                                 |
| 08            | 8                | HORRSENM   | RSE name or IMS ID                                                         |
| 10            | 8                | HORDBD     | DBD name                                                                   |
| 18            | 8                | HORPSB     | PSB name                                                                   |
| 18            | 1                | HORPSB0    | C'0'                                                                       |
| 19            | 7                | HORPART    | Partition name                                                             |
| 20            | 4                | HORDUSN    | Update sequence number (USN)                                               |
| 24            | 4                | HORDUSID   | Update set ID (USID)                                                       |



Table 227. X'2940' log record layout (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 28            | 1                | HORAFLG1   | Flags:<br>".... 0..."<br>This log record was created at the IMS doing the HALDB Online Reorganization.<br>".... 1..."<br>This log record was created by an IMS doing data sharing with the IMS doing the HALDB Online Reorganization.<br>".... .0..."<br>The database is not RSR covered.<br>".... .1..."<br>The database is RSR covered.<br>".... ..0..."<br>The A-thru-J and X data sets are the input data sets.<br>".... ..1..."<br>The M-thru-V and Y data sets are the input data sets.<br>".... ...0..."<br>PHDAM database.<br>".... ...1..."<br>PHIDAM database. |
| 29            | 12               | HORARATIM  | Time stamp of reorganization active. This is the time of the DBRC ALLOC for the first output data set.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**X'2950': cursor movement**

The cursor was updated. The X'2950' log record appears before the X'3730' log record that indicates that a unit of reorganization was committed.

The following table describes the X'2950' log record layout.

Table 228. X'2950' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                          |
|---------------|------------------|------------|----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                           |
| 04            | 1                | HORTYPE    | X'29' Record type                                                          |
| 05            | 1                | HORSTYPE   | X'50' Record sub-type                                                      |
| 06            | 2                | HORPSTNO   | PST number                                                                 |
| 08            | 8                | HORRSENM   | RSE name or IMS ID                                                         |
| 10            | 8                | HORDBD     | DBD name                                                                   |
| 18            | 8                | HORPSB     | PSB name                                                                   |
| 18            | 1                | HORPSB0    | C'0'                                                                       |

Table 228. X'2950' log record layout (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                               |
|---------------|------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                  |
| 20            | 8                | HORMUORS   | Segments moved in this UOR                                                                                                                                                                                                      |
| 28            | 8                | HORMUORZ   | Size moved in this UOR                                                                                                                                                                                                          |
| 30            | 8                | HORMRSEG   | Total segments moved before this UOR                                                                                                                                                                                            |
| 38            | 8                | HORMRSZE   | Total size moved before this UOR                                                                                                                                                                                                |
| 40            | 4                | HORMORSA   | Number of roots moved this UOR                                                                                                                                                                                                  |
| 44            | 4                | HORMLOCK   | Lock count for this OLR                                                                                                                                                                                                         |
| 48            | 4                | HORMSTT    | UOR start time, in unsigned binary format                                                                                                                                                                                       |
| 4C            | 12               | HORMUTST   | UOR start time, in UTC format                                                                                                                                                                                                   |
| 58            | 4                | HORMTIME   | Execution time                                                                                                                                                                                                                  |
| 5C            | 4                | HORMWAIT   | Wait time                                                                                                                                                                                                                       |
| 60            | 4                | HORMORSZ   | UOR size calculated                                                                                                                                                                                                             |
| 64            | 4                | HORMORW1   | Not used                                                                                                                                                                                                                        |
| 68            | 4                | HORMORW2   | Not used                                                                                                                                                                                                                        |
| 6C            | 8                | HORMCHNG   | DFSORP20 CHANGEID                                                                                                                                                                                                               |
| 74            | 1                | HORMFLG1   | Flags:<br>". . . . . 0."<br>The A-thru-J or X data sets are the input data sets<br>". . . . . 1."<br>The M-thru-V or Y data sets are the input data sets<br>". . . . . 0"<br>PHDAM database<br>". . . . . 1"<br>PHIDAM database |
| 75            | 4                | HORMRBA    | PHDAM cursor RBA                                                                                                                                                                                                                |
| 75            | 1                | HORMKLN    | Length of root key for PHIDAM                                                                                                                                                                                                   |
| 76            | <i>n</i>         | HORMKEY    | PHIDAM cursor root key. The length <i>n</i> is the length of the root key.                                                                                                                                                      |

**X'2970': cursor-active status reset**

The cursor is inactive. Copying from the input to the output data sets has completed. The reorganization was recorded through DBRC as no longer being in a cursor-active status.

The following table describes the X'2970' log record layout.

Table 229. X'2970' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 04            | 1                | HORTYPE    | X'29' Record type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 05            | 1                | HORSTYPE   | X'70' Record sub-type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 06            | 2                | HORPSTNO   | PST number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 08            | 8                | HORRSENM   | RSE name or IMS ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10            | 8                | HORDBD     | DBD name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 18            | 8                | HORPSB     | PSB name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 18            | 1                | HORPSB0    | C'0'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 19            | 7                | HORPART    | Partition name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 20            | 4                | HOREUSN    | Update sequence number (USN)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 24            | 4                | HOREUSID   | Update set ID (USID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 28            | 1                | HOREFLG1   | Flags:<br><b>B'10.. ....'</b><br>The NODEL option is now in effect.<br><b>B'01.. ....'</b><br>The DEL option is now in effect.<br><b>B'.... 0...'</b><br>This log record was created at the IMS doing the HALDB Online Reorganization.<br><b>B'.... 1...'</b><br>This log record was created by an IMS doing data sharing with the IMS doing the HALDB Online Reorganization.<br><b>B'.... .0..'</b><br>The database is not RSR covered.<br><b>B'.... .1..'</b><br>The database is RSR covered.<br><b>B'.... ..0.'</b><br>The A-thru-J or X data sets are the input data sets.<br><b>B'.... ..1.'</b><br>The M-thru-V or Y data sets are the input data sets.<br><b>B'..1. ....'</b><br>The NOREL option is now in effect.<br><b>B'...1 ....'</b><br>The REL option is now in effect. |
| 29            | 12               | HORCITIM   | Time stamp of cursor inactive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**X'2971': conditional reset of the cursor active**

OLR has completed copying all data from the input data sets to the output data sets. Following this log record an attempt to reset cursor active in the RECON will be made.

The following table describes the X'2971' log record layout.

Table 230. X'2990' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                          |
|---------------|------------------|------------|----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number |
| 02            | 2                | HORRSV1    | X'0000'                                                                    |
| 04            | 1                | HORTYPE    | X'29' Record type                                                          |
| 05            | 1                | HORSTYPE   | X'71' Record sub-type                                                      |
| 06            | 2                | HORPSTNO   | PST number                                                                 |
| 08            | 8                | HORRSENM   | RSE name or IMS ID                                                         |
| 10            | 8                | HORDBD     | DBD name                                                                   |
| 18            | 8                | HORPSB     | PSB name                                                                   |
| 18            | 1                | HORPSB0    | C'0'                                                                       |
| 19            | 7                | HORPART    | Partition name                                                             |

**X'2990': ownership relinquished**

Ownership of the reorganization for a partition was relinquished through DBRC.

See [Table 230 on page 550](#) for X'2990' log record layout.

Table 231. X'2990' log record layout

| Offset (hex.) | Length (decimal) | Field name | Field description                                                          |
|---------------|------------------|------------|----------------------------------------------------------------------------|
| 00            | 2                | HORLENG    | Length of this record, including this length field and the sequence number |
| 02            | 2                | HORRSV1    | X'0000' Reserved                                                           |
| 04            | 1                | HORTYPE    | X'29' Record type                                                          |
| 05            | 1                | HORSTYPE   | X'90' Record sub-type                                                      |
| 06            | 2                | HORPSTNO   | PST number                                                                 |
| 08            | 8                | HORRSENM   | RSE name or IMS ID                                                         |
| 10            | 8                | HORDBD     | DBD name                                                                   |
| 18            | 8                | HORPSB     | PSB name                                                                   |
| 18            | 1                | HORPSB0    | C'0'                                                                       |
| 19            | 7                | HORPART    | Partition name                                                             |

Table 231. X'2990' log record layout (continued)

| Offset (hex.) | Length (decimal) | Field name | Field description                                                                                                                                                                                                                        |
|---------------|------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22            | 1                | HORREAS    | Reason for relinquishing ownership:<br><b>X'80'</b><br>Normal completion of the online reorganization.<br><b>X'40'</b><br>Pseudo-abend during an online reorganization.<br><b>X'20'</b><br>TERM command during an online reorganization. |
| 21            | 4                | HORABTRM   | Pseudo-abend code                                                                                                                                                                                                                        |
| 25            | 8                | HORSEGCT   | Number of segments copied                                                                                                                                                                                                                |

### Format of X'67' log record

A physical log record consists of one or more subrecords. Each subrecord is followed by its associated data.

The following figure shows the layout of the X'67' log record.

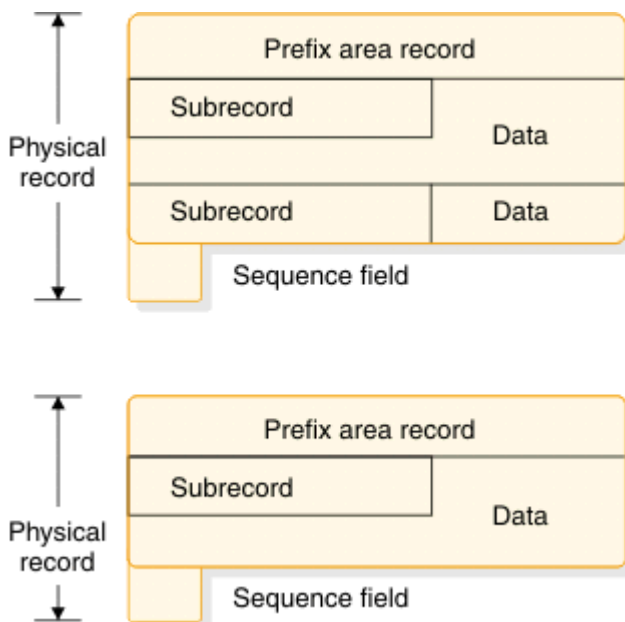


Figure 76. X'67' log record layout

### Related tasks

[“Program isolation trace” on page 214](#)

The program isolation (PI) trace traces all calls to the IMS enqueue/dequeue module (DFSFXC10) and writes the trace entries to the system log as type X'67FA' records.

### Log record prefix area format

The log record prefix area formats for X'67' and X'67FA' records are shown, including the offset, length, and a brief description.

*Table 232. Log record prefix area format for X'67'*

| Offset (hexadecimal) | Length (decimal) | Description                                 |
|----------------------|------------------|---------------------------------------------|
| 00                   | 2                | Length of record, including sequence number |
| 02                   | 2                | Reserved                                    |
| 04                   | 1                | X'67' record type                           |
| 05                   | 1                | X'FB' X'FD' X'FF'                           |
| 06                   | 2                | Reserved                                    |
| 08                   | 4                | Requestor identification                    |
| 0C                   | 2                | Record segment number                       |
| 0E                   | 2                | Reserved                                    |
| 10                   | 4                | Time                                        |
| 14                   | 4                | Date                                        |
| 18                   | 4                | Reserved                                    |
| 1C                   | 4                | Condition indicator                         |

For X'67FA' records, the order of the fields from offset X'08' through X'14' is shown in the following table.

*Table 233. Log record prefix area format for X'67FA' records*

| Offset (hexadecimal) | Length (decimal) | Description          |
|----------------------|------------------|----------------------|
| 08                   | 4                | Date                 |
| 0C                   | 4                | Time                 |
| 10                   | 2                | Table identification |
| 12                   | 2                | Flag bytes           |

### Log subrecord and data area

The X'67' log subrecord uses the data format given in the following table.

*Table 234. Log subrecord area format*

| Offset (hexadecimal) | Length (decimal) | Description                                                                         |
|----------------------|------------------|-------------------------------------------------------------------------------------|
| 00                   | 8                | Element identification                                                              |
| 08                   | 2                | Reserved                                                                            |
| 0A                   | 2                | Element data length, excluding descriptor                                           |
| 0C                   | 4                | Main storage address of data when logged; zero when continued from previous element |

Table 235. Log data area format

| Offset (hexadecimal) | Length   | Description |
|----------------------|----------|-------------|
| 10                   | variable | Logged data |

### Log sequence field format

The log sequence field format is described in the following table.

Table 236. Log sequence field format

| Offset (hexadecimal) | Length (decimal) | Description                                                                                                             |
|----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------|
| n                    | 8                | STCK time stamp representing the time the log record was written. The time stamp is not necessarily on a word boundary. |
| n+8                  | 8                | Sequence number within the IMS control region.                                                                          |

### Format of OTMA X'6701' log records

OTMA uses the X'6701' log record to document the sending and receiving of certain types of messages, such as messages associated with the processing of synchronous callout requests.

In shared queues environments, OTMA and APPC also use X'6701' log records to document the receipt of certain messages in a front-end IMS system that are sent from a back-end IMS system via a z/OS cross-system coupling facility (XCF).

#### Format of synchronous callout log records

Synchronous callout messages are non-recoverable OTMA messages that are initiated by an ICAL call through the AIBTDLI interface. These messages do not go through the IMS message queue structure.

The processing of a synchronous callout request and its corresponding response involves the exchange of a number of different message types, such as a resume tpipe request message, the callout request message, the ACK or NAK message to the callout request, the response message, and so forth.

For each possible type of message that is exchanged in the processing of a synchronous callout request and its response, a simplified X'6701' log record is written that contains an ID that identifies the type of message the log record documents.

The message-type identifier for each message type is displayed in the ID= field in the log records. Message types are identified by the following ID= values that are shown in alphabetical order:

#### YACK

ACK that OTMA received from the client for a callout request

#### YAKO

ACK that OTMA sent to the client for a callout response

#### YCRT

CANCEL RESUME TPIPE request that OTMA received from the client, usually as a result of the timeout of a RESUME TPIPE request

#### YNAK

NAK that OTMA received from the client for a callout request

#### YNKO

NAK that OTMA sent to the client for a callout response

#### YOUT

Synchronous callout request that OTMA sent to the client

#### YPSI

ACK or NAK that OTMA received from the client is sent to a wrong IMS system, or delayed ACK or NAK that is received by OTMA

#### YRSP

Response to the synchronous callout that OTMA received from the client

## YRTR

RESUME TPIPE request that OTMA received from the client

In the output log records, all the messages for a particular synchronous callout request share the same correlation ID and the message types are recorded in the order in which they occur in the flow during synchronous callout processing.

In the flow of a typical synchronous callout interaction, the message types occur in the following order:

1. YRTR
2. YOUT
3. YACK or YNAK
4. YRSP
5. YAKO or YNKO
6. YCRT

## Examples of formatted X'6701' log records

The X'6701' log records for each message type in OTMA callout processing have a similar format. The format shown in following examples is representative of the format of all OTMA X'6701' log records for synchronous callout processing.

### YOUT example of the OTMA X'6701' log record

The following example shows an X'6701' log record with ID = YOUT. The YOUT record is written when a synchronous callout message is sent to an OTMA client, such as IMS Connect.

```
INTERNAL TRACE RECORD          ID = YOUT  SEGN0=00  RECNO = 0000082F  TIME 12:48:22.189  DATE
2008.234?
MCI
PREF

 0992D84E 000000                                0180   20000020  E3D7C9D7  C5F14040  A0F00000
*          .....TPIPE1 .0..*
0992D860 000012  00030000 00000000 00000001 0000
*          .....STATE .....0 ..*
STATE

 0C29F040 000000  00482048 01004040 40404040 40400000  00000000 00B60000 00000000 00000000
*          .....*
0C29F060 000020  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
*          .....*
0C29F080 000040  00000000 00000000
*          .....SECURITY.....0H.....FP*
SECURITY

 0C29F088 000000                                000E0000 0902C6D7  C5F0F0F0  F140                                *          .....FPE0001
USER SGM..*
USER
SGM

 0C29F096 000000                                0100 00000000 00000000
*          .....*
0C29F0A0 00000A  0000E3D7  C9D7C5F1 40400000 00000000  00000000 00000000 00000000 00000000
*..TPIPE1 .....*
0C29F0C0 00002A  00000000 00000000 00000000 00000000  00000000 40000000 00000000 00000000
*          .....*
0C29F0E0 00004A  00000000 00000100 00000000 00000000  00000000 00000000 00000000 00000000
*          .....*
0C29F100 00006A  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
*          .....*
0C29F120 00008A                                SAME AS
ABOVE
0C29F140 0000AA  00000000 00000000 00000000 00280000  C9D4E2F1 01000017 00220002 C2E0DE33
*          .....IMS1.....B...*
0C29F160 0000CA  9B08FE7C  E3D7C9D7 C5F14040 C6D7C5F0  F0F0F140 00000000 00000000 00000000 *...@TPIPE1
FPE0001 .....*
0C29F180 0000EA  00000000 00000000 00000000 00000000  00000000 0000
*          .....APPL SGM..*
APPL
SGM

 0C29F196 000000                                0068 0000C6C9 D9E2E340
*          .....FIRST *
0C29F1A0 00000A  D4C5E2E2  C1C7C540 C9E240E2 C5D5E340  E3D640C3 D3C9C5D5  E3404040 40404040 *MESSAGE IS SENT TO
CLIENT *
0C29F1C0 00002A  40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
```



```

*
0C29F1E0 00004A 40404040 40404040 40404040 40404040 40404040 40404040 40404040 4040
*
B.*

```

### YACK example of the X'6701' log record

The following example shows an X'6701' log record with ID = YACK. The YACK record is written when a synchronous callout message is sent to an OTMA client, such as IMS Connect.

After a synchronous callout message is received and an acknowledgment is sent back to OTMA, OTMA writes the following X'6701' log record with ID = YACK:

```

INTERNAL TRACE RECORD          ID = YACK  SEGNO=00  RECNO = 00000830  TIME  12:48:22.303  DATE
2008.234?
MCI
PREF

 7F2D8E28 000000                01208000 0000E3D7  C9D7C5F1 4040A0E0 0000000F 00000000
* .....TPIPE1 .....*
 7F2D8E40 000018 00000000 00010000
* .....STATE .....*
STATE

 7F2D8E48 000000                00482040 01000000  00000000 00000000 00000000 00B60000
* .....*
 7F2D8E60 000018 00000000 00000000 00000000 0000C2E0  DE2137C9 6A780000 00000000 00000000
* .....B.....I.....*
 7F2D8E80 000038 00000000 0000E3C5  E2E3D3E3 D9D40000
* .....TESTLTRM..SECURITY.....*
SECURITY

 7F2D8E90 000000                006AC614 0902E4E2  D9E3F0F0 F1400903
* ..F...USRT001 ..*
 7F2D8EA0 000010 40404040 40404040 00000000 00000000 00000000 00000000 00000000 00000000
* .....*
 7F2D8EC0 000030 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* .....*
 7F2D8EE0 000050 00000000 00000000 00000000 00000000 00000000 00000000 0000
* .....USER S*
USER
SGM

 7F2D8EFA 000000                0100 0000C9D4
* .....IM*
 7F2D8F00 000006  E2F14040 4040E3D7  C9D7C5F1 4040F9F9  F9F94040 4040C2E0  DE2137C8 E2B80000  *S1  TPIPE1  9999
B....HS...*
 7F2D8F20 000026 00000000 00000000 00000BB7 ED480000 00000000 00001000 40640000 00004040
* .....*
 7F2D8F40 000046 40404040 40400000 00000200 00000000 00000000 00004040 40404040 40400000
* .....*
 7F2D8F60 000066 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
* .....*
 7F2D8F80 000086 TO 7F2D8FC0 0000C6  SAME AS
ABOVE
 7F2D8FE0 0000E6 00000000 00000000 00000000 00000000 00000000 00000000 0000
* .....B.....*

```

### YRSP example of the X'6701' log record

After OTMA receives a response for a synchronous callout message, the following X'6701' log record with ID = YRSP is written:

```

INTERNAL TRACE RECORD          ID = YRSP  SEGNO=00  RECNO = 00000831  TIME  12:48:22.305  DATE
2008.234?
DFSERA30 - FORMATTED LOG
PRINT                                     PAGE 0002
MCI
PREF

 7F2D8E10 000000                01800800 0000E2E8  D5C3D9C5 E2D7A0F0
* .....SYNCRESP.0*
 7F2D8E20 000010 00000010 00000000 00000000 00010000
* .....STATE .....*
STATE

 7F2D8E30 000000                00480040 01000000  00000000 00000000
* .....*
 7F2D8E40 000010 00000000 00B60000 00000000 00000000 00000000 0000C2E0  DE33B714 1FBA0000
* .....B.....*
 7F2D8E60 000030 00000000 00000000 00000000 0000E3C5  E2E3D3E3 D9D40000
* .....TESTLTRM..SECURITY*
SECURITY

 7F2D8E78 000000                006AC614 0902C7D6

```

```

*          ..F...G0*
7F2D8E80 000008   C6C9E2C8 C9D50903   40404040 40404040   00000000 00000000   00000000 00000000
*FISHIN...
7F2D8EA0 000028   00000000 00000000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F2D8EC0 000048   SAME AS
ABOVE
7F2D8EE0 000068   0000
SGM....".S....IMS1   SY*
USER
SGM

7F2D8EE2 000000   0100 0000C9D4   E2F14040 4040E2E8   D5C3D9C5 E2D7F9F9   F9F94040 4040C2E0   *   ....IMS1
SYNCRESP9999   B.*
7F2D8F00 00001E   DE33B713 C5BA0000   00000000 00000000   00000BB7 EAB00000   00000000 00000000
*....E.....*
7F2D8F20 00003E   40E90000 00004040   40404040 40400000   00000200 00000000   00000000 00004040   *
Z.....*
7F2D8F40 00005E   40404040 40400000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F2D8F60 00007E   00000000 00000000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F2D8F80 00009E   00000000 00000000   00000000 00000000   00000000 00000000   00280000 C9D4E2F1
*.....IMS1*
7F2D8FA0 0000BE   01000017 00220002   C2E0DE33 9B08FE7C   E3D7C9D7 C5F14040   C6D7C5F0 F0F0F140
*.....B.....@TPIPE1   FPE0001 *
7F2D8FC0 0000DE   00000000 00000000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F2D8FE0 0000FE   0000
SGM....".S....RESPONSE T*
APPL
SGM

7F2D8FE2 000000   001E 0000D9C5   E2D7D6D5 E2C540E3   D640E2E8 D5C3C840   C3C1D3D3 D6E4E340   *   ....RESPONSE TO
SYNCH CALLOUT *

```

### YNAK example of the X'6701' log record

If OTMA receives a negative acknowledgment (NAK) for the synchronous callout message from its client, the following X'6701' log record with ID = YNAK is written:

```

INTERNAL TRACE RECORD          ID = YNAK  SEGNO=00  RECNO = 000008AC  TIME 12:50:52.645  DATE
2008.234?
MCI
PREF

7F363E28 000000          01204000 0000E3D7   C9D7C5F1 4040A0E0   00000014 00000DAC
*.....TPIPE1.....*
7F363E40 000018   00000000 00010000
*.....STATE.....*
STATE

7F363E48 000000          00482040 01000000   00000000 00000000   00000000 00B60000
*.....*
7F363E60 000018   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F363E80 000038   00000000 0000E3C5   E2E3D3E3 D9D40000
*.....TESTLTRM..SECURITY.....*
SECURITY

DFSERA30 - FORMATTED LOG
PRINT
7F363E90 000000          006AC614 0902E4E2   D9E3F0F0 F1400903          PAGE 0006
*          ..F...USRT001 ..*
7F363EA0 000010   40404040 40404040   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F363EC0 000030   00000000 00000000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F363EE0 000050   00000000 00000000   00000000 00000000   00000000 0000
*.....USER S*
USER
SGM

7F363EFA 000000          0100 0000C9D4
*          ....IM*
7F363F00 000006   E2F14040 4040E3D7   C9D7C5F1 4040F9F9   F9F94040 4040C2E0   DEB11E60 BEB50000   *S1   TPIPE1   9999
B.....*
7F363F20 000026   00000000 00000000   00000BB7 ED480000   00000000 00001000   40640000 00004040
*.....*
7F363F40 000046   40404040 40400000   00000200 00000000   00000000 00004040   40404040 40400000
*.....*
7F363F60 000066   00000000 00000000   00000000 00000000   00000000 00000000   00000000 00000000
*.....*
7F363F80 000086   TO 7F363FC0 0000C6   SAME AS
ABOVE
7F363FE0 0000E6   00000000 00000000   00000000 00000000   00000000 00000000   0000
*.....B...C...*

```

**Format of the TIB3 X'6701' log record for OTMA and APPC messages in a shared queues environment**

When AOSLOG=Y is specified in the DFSDCxxx member of the PROCLIB data set of a front-end IMS system in a shared queues group, the front-end IMS system writes an X'6701 log record for certain messages that are received from a back-end IMS via a z/OS cross-system coupling facility (XCF). The log records for these messages are identified by a value of TIB3 in the ID= field of the log record for the message.

A front-end system writes an X'6701' log record for OTMA or APPC messages in the following cases:

- Response message returned from the back-end system by XCF for transactions with synchronization levels of NONE, CONFIRM, and SYNCPT.
- Error message returned from the back-end system by XCF for transactions with all synchronization levels of NONE, CONFIRM, and SYNCPT.

**Example of a formatted X'6701' log record with ID = TIB3**

The following example shows an X'6701' log record with ID = TIB3.

```
INTERNAL TRACE RECORD          ID = TIB3  SEGNO=00  RECNO = 0000077D  TIME 19:44:57.509  DATE 2010.120
MSG PREF
0C6DF040 000000 027A0000 0040D581 85D50000 F9F9F9F9 40404040 C1D7D6D3 F1F14040 C5E8FA11 *.... NAEN..9999
APOL11 EY..*
DFSERA30 - FORMATTED LOG
PRINT
0C6DF060 000020 E47F3023 C0000000 0C1AB060 C8E6E2F1 40404040 40404040 40404040 C9D4E2F1 *U".....-
HWS1 IMS1*
0C6DF080 000040 40404040 C5E8FA11 E4759D23 121000A8 C5E8FA11 E47F3023 00000000 00000000 *
EY..U.....YU".....*
0C6DF0A0 000060 00000000 00000000 0C1AB060 00000000 00000000 C9D4E2F1 00000000 00000000
*.....IMS1.....*
0C6DF0C0 000080 00000000 00000000 00000000 C5E8FA11 E45D4C63 00000000 00000000 00000000
*.....EY..U)<.....*
0C6DF0E0 0000A0 00000000 00000000
*.....*
MCI PREF
0C6DF0E8 000000 01400000 0000F9F9 F9F94040 4040A0F0 0000000A 00000000
*.....9999 .0.....*
0C6DF100 000018 00000000 00010000
*.....*
STATE
0C6DF108 000000 00481020 00000000 00000000 00000000 00000000 00000000
*.....*
0C6DF120 000018 00000000 00000000 00000000 0000C5E8 FA11E452 72630000 00000000 00000000
*.....EY..U.....*
0C6DF140 000038 00000000 00004040 40404040 40400000
*.....*
SECURITY
0C6DF150 000000 006AC614 0902E4E2 D9E3F0F0 F3400903
*.....F...USRT003 ...*
0C6DF160 000010 E2E8E2F1 40404040 00000000 00000000 00000000 00000000 00000000 00000000
*SYS1 .....*
0C6DF180 000030 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0C6DF1A0 000050 00000000 00000000 00000000 00000000 00000000 0000
*.....*
USER SGM
0C6DF1BA 000000 0100 0000C9D4
*.....IM*
0C6DF1C0 000006 E2F14040 4040C3D3 C9C5D5E3 F0F1F9F9 F9F94040 4040C5E8 FA0FC71D 20EB0000 *S1 CLIENT019999
EY..G.....*
0C6DF1E0 000026 00000000 00000000 00000C67 FC300000 00000000 00001010 20280000 00004040
*.....*
0C6DF200 000046 40404040 40400000 00000203 00000000 00000000 00004040 40404040 40400000
*.....*
0C6DF220 000066 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*.....*
0C6DF240 000086 TO 0C6DF280 0000C6 SAME AS ABOVE
0C6DF2A0 0000E6 00000000 00000000 00000000 00000000 00000000 0000
*.....*
APPL SGM
0C070500 000000 002A0300 E3C8C1E3 E240C1D3 D340C6D6 D3D2E240 D4C5E2E2 C1C7C540 F1406BE2 *...THATS ALL FOLKS
MESSAGE 1 ,S*
0C070520 000020 C5C7D4C5 D5E340F1 404B *EGMENT
1 . *
UDATA
0C5F8D1C 000000 003E0000
*.....*
0C5F8D20 000004 0C1AB060 0C1AC330 C9D4E2F2 40404040 0000000D 00000000 C9D4E2F1 40404040
*...C.IMS2 .....IMS1 *
0C5F8D40 000024 C5E8FA11 E48FC3A3 C9D4E2F1 40404040 C5E8FA11 E48FC3A3 4000 *EY..U.CTIMS1
EY..U.CT . *
YTIB
0C1AB330 000000 E8E3C9C2 E8E3C9C2 00000000 0C1AB060 *
YTIBYTIB.....*
```

```

0C1AB340 000010 0C6D90A0 F9F9F9F9 40404040 0A5398D0 00000000 00000000 E4E2D9E3 F0F0F340
*...9999 ..Q.....USRT003 *
0C1AB360 000030 E2E8E2F1 40404040 00000000 00000000 00000000 00000000 00000000 00000000
*SYS1 .....*
0C1AB380 000050 00000000 00400100 004A0023 00010100 006A0023 00024840 D5810000 00000000
*.....NA.....*
0C1AB3A0 000070 00000000 C5E8FA11 E47F3023 0C6DF040 0C66F048 C1D7D6D3 F1F14040 0000
*...EY..U"....0 ..0.APOL11 .. *
INTERNAL TRACE RECORD ID = TIB3 SEGNO=01 RECNO = 0000077E TIME 19:44:57.509 DATE 2010.120
CONTINUE
0C1AB3BE 00008E 0000
*.....*
0C1AB3C0 000090 00000000 00000000 00000000 00000000 00000000 00000000 00000000 C0000000
*.....*
0C1AB3E0 0000B0 00000000 00000000 00000000 00000000 0000037A 0C070448 0C6DF0E8 0C6DF108
*....._OY..1..*
0C1AB400 0000D0 0C6DF150 0C6DF1BA 7F2BBFEA 00000000 00028000 00000000 00000000 00000000
*_1&..1.".....*
0C1AB420 0000F0 00000000 00000000 000100EF 00000000 C9D4E2F2 40404040 00000000 00000000
*.....IMS2.....*
0C1AB440 000110 40404040 40404040 00000168 20000000 00000000 00000000 C5E8FA11 E4527263
*.....EY..U.....*
0C1AB460 000130 C9D4E2F2 40404040 0000000D 00000000 00000000 00000000 00000000 00000000
*IMS2 .....*

```

## Printing log records and trace table entries

You can use the File Select and Formatting Print utility (DFSERA10) to print both log records from the IMS log data set and the externalized trace table entries that are recorded in the DFSTRAXX data set.

Formatting of the DFSTRAXX trace entries is similar to formatting trace records that are contained on the IMS log; however, the external trace data set contains only records with an ID of X'67FA'.

Figure 77 on page 559 and Figure 78 on page 559 show examples of unformatted and formatted log records. Unformatted log records include the prefix area record, the subrecord, data, and a table offset in hexadecimal. The formatted record contains the data area with its actual offset address and the table offsets.

```

DFSERA10 - Print program
000000 00540000 67FF0000 C1C2D5C4 00010000 16435280 0087049F 00000000 800000FC *.....ABND.....G.....*
000020 E2D5C1D7 C9C4407E 00000020 000D7000 E2D5C1D7 C9C4407E C1C2D5C4 40D9C5C7 *SNAPID =.....SNAPID =ABND REG*
000040 0107015D 0000010B 00000000 0081B330 0000015C *...}.....C....*
000000 04140000 67FF0000 C1C2D5C4 00020000 16435280 0087049F 00000000 900000FC *.....ABND.....G.....*
000020 E2C3C440 40404040 000003D0 00816698 E2E2C3C4 008166A4 18FF07FE 0AE707FE *SCD .....QSSCD...U...X..*
000040 00009301 02203821 02008400 E2E8E2F1 40404040 00814FB0 00813230 00000000 *..L.....D..SYS1 ..|.....*
    ↑
    physical displacement
...
    ↓ prefix record    ↓ record sequence for this abend
000000 04140000 67FF0000 C1C2D5C4 00060000 16435280 0087049F 00000000 800000FC *.....ABND.....G.....*
                                     ↑
                                     ABENDU0252
    ↓ subrecord    ↓ PST address
000020 D7E2E340 40404040 000003E0 008DD050 00000D7B 2480501A 0000000D 008DD09F4 *PST .....&...#...&.....R4*
000040 00964280 0000003C C0000000 00000000 008DD0B8 00080008 008DD0B0 00100010 *.0.....Y.....*
000060 008DD0B2 00020002 008DD0B4 008DD0B8 008DD0B0 008DD0C0 00080008 008DD0C8 *.....H.....*
000080 00080008 00000000 40404040 40404040 10004040 0000000F 0000000F 00000000 *.....PBVSAL*
0000C0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 *.....*
...
    ↓ prefix record
000000 04140000 76FF0000 C1C2D5C4 00007000016435280 0087049F 00000000 800000FC *.....ABND.....G.....*
    ↓ subrecord    ↓ no address on block (PST) continuation
000020 D7E2E340 40404040 000003E0 00000000 00000000 00AF9CC6 0000000D 00953B3F *PST .....F....N..*
000040 00953A48 00953B3F 00953A40 00000000 07000000 00000000 00000258 00000000 *.N...N...N.....*
000060 00000000 00953D40 00000000 00953400 00000000 00000000 00000000 00000000 *.....N. ....N.....*
...

```

Figure 77. Unformatted output using DFSERA10

```

                                ↓ ABENDU0252
DFSERA30 - Formatted log print
MP/BMP REG ABEND REC. AB CODE SYS = 0000 USER = 0252 RECNO = 0000015C TIME 16.43.52 DATE 87.049
SCD
00B16698 000000 E2E2C3C4 008166A4 18FF07FE 0AE707FE 00009301 02203821 02008400 E2E8E2F1 *SSCD...U...X...L.....D.SYS1*
00B166B8 000020 40404040 00814FB0 00813230 00000000 0000C0C0 00816770 00816818 008168A4 * ..|.....U*
...
PST
008DD050 000000 00000D7B 2480501A 0000000D 008DD09F4 00964280 0000003C C0000000 00000000 *...#...&.....R4.0.....*
    ↑ original address displacement
    ↑ table displacement
008DD070 000020 008DD0A8 00080008 008DD0B0 00100010 008DD0B2 00020002 008DD0B4 008DD0B8 *...Y.....*
008DD090 000040 008DD0B8 008DD0C0 00080008 008DD0C8 00080008 00000000 40404040 40404040 *.....H.....*
008DD0B0 000060 10004040 0000000F 0000000F 00000000 00000000 00000000 00000000 D7C2E5C4 E2C1D3D9 *.. .....PBVSAL*
008DD0D0 000080 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 *.....*
...

```

Figure 78. Formatted output using DFSERA10 with option statement, Exit=DFSERA30

**Related concepts**  
[“SNAPs on exceptional conditions” on page 154](#)

IMS produces SNAPs of DL/I control blocks on the IMS log (or the CICS system log).

## Log Merge utility

---

The Log Merge utility can merge up to nine IMS system logs. Each log is the output of a uniquely identified IMS system that is running during the same time span.

The Log Merge utility (DFSLTMG0) produces one data set that is used as input to the Log Transaction Analysis utility by merging the system log data sets (SLDS) from two or more IMS systems.

## Formatting IMS dumps offline

---

Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

### Related concepts

[“Starting the OTMA trace” on page 354](#)

The **/TRACE SET ON TABLE OTMT** command activates the trace and sends the entries to an internal table.

### Related tasks

[“ABENDU1026 analysis” on page 391](#)

To analyze ABENDU1026 failures, you determine the documentation to obtain, and how to find and interpret diagnostic data from the documentation. Gather the necessary data before searching an IBM Software Support database or calling the IBM Software Support.

[“Starting the Online Recovery Manager trace” on page 207](#)

The **/TRACE SET ON TABLE ORTT** command activates the trace and sends the entries to an internal table.

[“Starting the LU manager trace” on page 329](#)

The **/TRACE SET ON TABLE LUMI** command activates the trace and sends the entries to an internal table.

### Related reference

[“Storage manager trace” on page 675](#)

The storage manager trace writes a record each time it is called to allocate a pool, get a buffer, or release a buffer. The storage manager traces requests from the following pools: AOIP, CESS, CIOP, CMDP, DYNP, EMHB, FPWP, HIOP, LUMC, LUMP, and SPAP.

## Overview of the IMS Offline Dump Formatter

The IMS Offline Dump Formatter (ODF) is a formatting option that reduces IMS control region abnormal termination processing.

During abend processing, IMS calls the SDUMP system service of z/OS to create a dump data set. Because SDUMP dumps the requested address spaces without formatting them, the processing time of an abnormal termination is shortened. After abend processing finishes, you can use the IMS Offline Dump Formatter to format (and print) either the complete dump or only those sections needed to analyze the problem.

One advantage of the IMS ODF is that you can make multiple formatting passes at the dump. This means you can first format a summary and then go back one or more times to format the control blocks that will help you most to analyze the problem IMS encountered.

Other advantages of the Offline Dump Formatter include:

- An integrated IMS dump that contains the address spaces of the IMS control region, DBRC, DL/I, and IRLM address spaces.

Also, the formatting modules are included in the dump data set. This ensures that the modules used for formatting the dump match the level of the dumped IMS control blocks. If you specify the REFRESH parameter on the user control statement for IPCS, you will get a new copy of the modules from the program library.

- You can use a z/OS stand-alone dump, SVC dump, or SYSMDUMP to produce the dump data set for the ODF to format.
- After formatting, you can either print the dump or use interactive aids such as IPCS and ISPF browse to view the dump.

Formatting dumps offline is the recommended option. If you want to format dumps online during abnormal termination, you must change the FMTO parameter to request a SNAP dump.

You cannot use the ODF to format z/OS trace and control block areas, the IRLM control blocks, or the VSAM modules.

### **Input for the IMS Offline Dump Formatter**

The dump data set you use for input to the IMS Offline Dump Formatter must include Key 0 and Key 7 CSA, the CVT, and SQA. CSA is not required for batch or CICS-local DL/I. The dump must be machine readable.

The most common input data sets are taken by SDUMPs, because the IMS control region automatically takes an SDUMP when one of its address spaces fails.

Even if a primary SDUMP request fails, the data dumped to the point of failure can still allow successful dump formatting. Some of this information might not be included in the data sets from a secondary SDUMP request, because on the secondary request only the address space that abends is dumped.

SYSMDUMPs, stand-alone dumps (SADMP), and sumps that are taken by the z/OS DUMP command usually produce acceptable input data sets.

For details of the SDUMP support job stream, refer to *IMS Version 14 System Definition*.

### **Related tasks**

[“ABENDU1026 analysis” on page 391](#)

To analyze ABENDU1026 failures, you determine the documentation to obtain, and how to find and interpret diagnostic data from the documentation. Gather the necessary data before searching an IBM Software Support database or calling the IBM Software Support.

### **Invoking the IMS Offline Dump Formatter**

To use the IMS Offline Dump Formatter, you must have an acceptable dump in a data set, a proper IMSDUMP entry in the IPCS exit control table and the IMS execution library with the dump formatting modules needed to be allocated to IPCS with the ddname ISPLLIB.

You then invoke the IMS Offline Dump Formatter by executing a VERBX control statement from IPCS, or through the interactive panels.

## **Solving IMS problems by using the IMS Offline Dump Formatter**

You can learn about how to approach IMS problems using IPCS and the IMS Offline Dump Formatter and how to choose FMTIMS parameters to format a system dump.

### **Approaching the problem**

The recommended diagnostic approach with the IMS Offline Dump Formatter is:

1. Use IEBGENER or IPCS COPYDMP to transfer the dump from the SYS1.DUMPxx data set to your own data set.
2. Get an overview of the problem by formatting the dump with the subset option SUMMARY.
3. Use the abend code or reason for abnormal termination, the CALLER=id, and the TCB=id from the dump title to determine the needed subset options.
4. Format the dump again with the subset options you determined in the previous step. Use the MIN qualifier (where possible) to reduce the output size. You can always format the data again if you need more information.

You might also need to format the z/OS trace and control block areas, the IRLM control blocks, or the VSAM modules. These blocks cannot be formatted with the IMS Offline Dump Formatter.

5. The formatted output is spooled. You can either print the output or use ISPF to browse it.
6. Do additional IMS subset formatting on following jobs if necessary.
7. If you still cannot locate or fix the problem, keep the dump data set because you need it when discussing the problem with an IBM Software Support representative.

### Using IPCS and the IMS offline dump formatter

You can interactively format IMS dumps offline by using a series of panels that provide formatting choices.

#### Method 1

Run the IMS Offline Dump Formatter as an IPCS verb exit to format and print the dump. You can then use IPCS to view unformatted dump storage referenced in your printed dump.

#### Method 2

Format, but do not print the dump. Invoke split screen mode on your terminal. On one half of the screen, use ISPF browse to view the formatted control blocks. On the other half, use IPCS to view any unformatted storage referenced in the formatted control blocks.

### Choosing FMTIMS parameters

Identify the general problem area before you attempt to choose FMTIMS parameters. If you are unsure of the problem area, format the dump with the SUMMARY option.

The following table shows the FMTIMS parameters that are recommended for general types of problems. For example, if you suspect the problem is with your logger, specify the DISPATCH, LOG, and SYSTEM parameters on the FMTIMS statement.

To use the following table, locate your problem area in the top row. Then read that column to find the suggested formatting options (marked with an X) for that problem.

Table 237. FMTIMS parameters for general problems

| Parameters | Problem area           |    |    |    |     |              |       |      |
|------------|------------------------|----|----|----|-----|--------------|-------|------|
|            | Checkpoint/<br>Restart | DB | DC | FP | Log | System/other | Batch | CICS |
| CBT        |                        | X  | X  |    |     | X            | X     | X    |
| CBTE       |                        |    | X  |    |     |              |       |      |
| DB         |                        | X  |    |    |     |              | X     | X    |
| DBRC       |                        | X  |    |    |     | X            | X     | X    |
| DC         |                        |    | X  |    |     |              | 2     |      |
| DEDB       |                        | X  |    | X  |     |              |       |      |
| DISPATCH   | X                      | X  | X  | X  | X   | X            | 3     |      |
| EMH        |                        | X  | X  | X  |     |              |       |      |
| LOG        |                        |    |    |    | X   |              | X     |      |
| MSDB       |                        | X  |    | X  |     |              |       |      |



Table 237. FMTIMS parameters for general problems (continued)

| Parameters            | Problem area           |    |    |    |     |              |       |      |
|-----------------------|------------------------|----|----|----|-----|--------------|-------|------|
|                       | Checkpoint/<br>Restart | DB | DC | FP | Log | System/other | Batch | CICS |
| QM                    |                        |    | X  |    |     |              | 2     |      |
| RESTART               | X                      |    |    |    |     |              | 2     |      |
| SAP                   |                        |    | X  |    |     |              |       |      |
| SAVEAREA <sup>1</sup> | X                      | X  | X  | X  | X   | X            | 2     |      |
| SB                    |                        | X  |    |    |     | X            | X     | X    |
| SCD <sup>1</sup>      | X                      | X  | X  | X  | X   | X            | X     | X    |
| SPST                  | X                      |    |    | X  |     |              | 2     |      |
| SUBS                  |                        |    |    |    |     | X            | 2     |      |
| SUMMARY <sup>1</sup>  | X                      | X  | X  | X  | X   | X            | X     | X    |
| UTIL                  |                        |    | X  | X  |     |              | 2     |      |

**Notes:**

1. You can use the single parameter (SYSTEM) to get the three areas (SAVEAREA, SCD, SUMMARY).
2. This parameter is ignored for batch.
3. (DISPATCH, MIN) is ignored for batch.

See [“Solving IMS problems by using the IMS Offline Dump Formatter”](#) on page 561 for a list of the modules formatted with each of the parameters. See [“Syntax restrictions on the FMTIMS statement”](#) on page 578 to understand the syntax rules for FMTIMS statements.

**Using the dump title to choose FMTIMS parameters**

When you are deciding which areas to format for your problem, you can use the CALLER and TCB fields of the dump title (described in [“Dump title”](#) on page 589) as a guide. Unless one or both of these fields specify "unknown," they should indicate why a dump was taken.

The following table shows the options you can choose based on valid CALLER and TCB information in the dump title.

Table 238. FMTIMS parameters based on CALLER and TCB fields

| CALLER=           | TCB=                                      | Recommended FMTIMS options <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CTL               | CTL LOG ESS<br>LSD LSM RDS<br>RST STC STM | DC <sup>2</sup> , Dispatch <sup>2</sup> , QM <sup>2</sup> , Summary, System <sup>2</sup> Dispatch <sup>2</sup> , SPST, System <sup>2</sup> , SUBS, Summary Dispatch, Log, Restart, Summary, System Dispatch <sup>2</sup> , MSDB, Savearea, SCD <sup>2</sup> , Summary Dispatch <sup>2</sup> , MSDB, Savearea, SCD <sup>2</sup> , Summary Restart, Savearea, SCD <sup>2</sup> , Summary Restart, Savearea, SCD <sup>2</sup> , Summary CBT, Dispatch <sup>2</sup> , Savearea, SCD <sup>2</sup> , Summary CBT, Dispatch <sup>2</sup> , Savearea, SCD <sup>2</sup> , Summary |
| CURR <sup>3</sup> | DYA                                       | Dispatch <sup>2</sup> , System <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| DBRC              | DBR                                       | DBRC <sup>2</sup> , System <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| DL/I              | DLI STC                                   | DB <sup>2</sup> , Dispatch <sup>2</sup> , SB <sup>2</sup> , System <sup>2</sup> CBT, Dispatch <sup>2</sup> , Savearea, SCD <sup>2</sup> , Summary                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DP                | BMP DEP                                   | DB <sup>2</sup> , System <sup>2</sup> DB <sup>2</sup> , System <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FP                | BMP DEP <sup>4</sup> XFP                  | DB <sup>2</sup> , DEDB, MSDB, System <sup>2</sup> DB <sup>2</sup> , DEDB, MSDB, System <sup>2</sup> DB <sup>2</sup> , SPST, System <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                          |
| LOG               | LOG                                       | Log <sup>2</sup> , System <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Notes:**

1. When you have a WAIT or LOOP problem, add SAVEAREA to your list of FMTIMS options.
2. Use the MIN qualifier for these options.
3. Normally dynamic allocation.
4. Can be either the MPP or the BMP region.

If CALLER=CURR, the current address space and IMS control region are dumped. This occurs when no CALLER parameter is provided or no IMSDUMP parameter list is passed and DFSFDMP0 cannot match the caller's TCB address and address space ID (ASID) with the TCBs in the IMS TCB table. You can still format the dump data set using the abend number and PSW as a guide in solving the problem. Dynamic allocation also causes CURR to be placed in the CALLER= field. In this case, format the areas listed in the above table.

If CALLER=DP, the abend occurred under the task of a dependent region address space.

If CALLER=IRLM, you need to use the IRLM Offline Dump Formatter to format the IRLM modules.

If CALLER=TRAP, a diagnostic trap for an address space abended.

**Offline Dump Formatter parameters**

The Offline Dump Formatter provides the option of choosing an 80-column output format in addition to the default value of 120/132 columns. This option allows viewing of formatter output on an 80-column-width screen without needing to shift left or right.

The 80-column format mode is normally selected when the IMS Offline Dump Formatter is run under IPCS and the IPCS default is set to TERMINAL NOPRINT or TERMINAL PRINT. This allows dump and z/OS formatting to be similar under IPCS. To select the 80-column format mode, add an "H" to the IMSDUMP formatter verb parameter string between the IMS job name and the FMTIMS keyword. The following are examples of 80-column format option requests under IPCS.

```
VERBX IMSDUMP 'imsname,R,H,D'
```

```
VERBX IMSDUMP 'imsname,H,FMTIMS SCD'
```

```
VERBX IMSDUMP 'imsname,D,H,R,FMTIMS (AUTO,MIN)'
```

### Sample FMTIMS statements

You might be able to identify a problem area more precisely by using the CALLER= and TCB= identification from the dump title along with the abend number and explanation. For example, you might see CALLER=CTL in the dump title and have an abend code that shows an error in the checkpoint restart processing. In this case, you can try specifying the statement:

```
FMTIMS (RESTART,SAVEAREA,(SCD,MIN),SUMMARY)
```

Following is a list of possible subsets you could format for specific error situations. This list is not exhaustive and is not meant to represent every possible error situation.

### IMS control region problems (CALLER=CTL)

An IMS control region address space task abended. A common definition is SYS—System Services.

#### **SYS/CHKPT**

System Service Checkpoint Restart Processing

```
FMTIMS (SUMMARY,SAVEAREA,(SCD,MIN),RESTART)
```

#### **SYS/CNTRL**

System Service Control

```
FMTIMS (SUMMARY,SAVEAREA,(SCD,MIN),(DISPA,MIN))
```

#### **SYS/ESS**

System Service External Subsystem Support

```
FMTIMS ((SYSTEM,MIN),SPST,(DISPA,MIN),SUBS)
```

#### **SYS/INIT**

System Service Initialization

```
FMTIMS (SUMMARY,SAVEAREA,(SCD,MIN))
```

#### **SYS/QMGR**

System Service Message Queue Management

```
FMTIMS (SUMMARY,SAVEAREA,(SCD,MIN),(DISPA,MIN),QM)
```

#### **SYS/SCHD**

System Service Scheduling

```
FMTIMS ((SYSTEM,MIN),SPST,(DISPA,MIN))
```

#### **SYS/SMGR**

System Service Storage Management

```
FMTIMS ((SYSTEM,MIN),SPST,CBT)
```

### DBRC problems (CALLER=DBRC)

A DBRC address space task abended. You would use the same FMTIMS statement for all of the following problems with Database Recovery Control:

#### **DBRC/CMD**

Database Recovery Control Command Processing

#### **DBRC/CNTRL**

Database Recovery Control Processor

**DBRC/EXIT**

Database Recovery Control Exit Processing

**DBRC/SER**

Database Recovery Control Services

FMTIMS ((SYSTEM,MIN), (DBRC,MIN))

**Data communication problems (CALLER=CTL)**

An IMS data communication task abended under the CTL TCB.

**DC/CMD**

Data Communication Command Processing

FMTIMS ((SYSTEM,MIN), DC)

**DC/CNTRL**

Data Communication Control

FMTIMS ((SYSTEM,MIN), (DC,MIN), (DISPA,MIN), (QM,MIN))

**DC/CONV**

Data Communication Conversational Processing

FMTIMS ((SYSTEM,MIN), (DC,MIN))

**DC/LMGR**

Data Communication Line Manager

FMTIMS ((SYSTEM,MIN), (DC,MIN))

**DC/MFS**

Data Communication Message Format Services

FMTIMS ((SYSTEM,MIN), (DC,MIN))

**DC/TPCALL**

Data Communication DL/I Telecommunications

Call Processing

FMTIMS ((SYSTEM,MIN), (DC,MIN), (DB,MIN))

**DL/I problems (CALLER=DL/I or CALLER=DP)**

A DL/I address space task abended.

**DB/ACSMTH**

Database Access Method Interface

FMTIMS ((SYSTEM,MIN), (DB,MIN))

**DB/ANAL**

Database Call Analyzer

FMTIMS ((SYSTEM,MIN), (DB,MIN))

**DB/CMGR**

Database Call Resource Management

FMTIMS ((SYST,MIN), (DB,MIN), (DISPA,MIN), (SB,MIN))

**DB/DBCALL**

Database Call Action Processing

FMTIMS ((SYSTEM,MIN), (DB,MIN))

**DB/INTRF**

Database Application/Scheduling Interface

FMTIMS ((SYSTEM,MIN), (DB,MIN), (DISPATCH,MIN))

## Fast Path problems (CALLER=FP)

A Fast Path task abended.

### FP/CNTRL

Fast Path Control

FMTIMS ((SYSTEM,MIN), (DB,MIN), SPST)

### FP/DEDB

Fast Path Data Entry Database Processing

FMTIMS ((SYSTEM,MIN), (DB,MIN), (DEDB,MIN))

### FP/EMH

Fast Path Expedited Message Handling Call Analyzer

FMTIMS ((SYSTEM,MIN), (DB,MIN), (EMH,MIN))

### FP/MSDB

Fast Path Main Storage Database Call Analyzer

FMTIMS ((SYSTEM,MIN), (DB,MIN), (MSDB,MIN))

## Log problems (CALLER=LOG)

An IMS control region address space log TCB task abended. Log is part of SYS—System Services.

### SYS/LOG

System Service Logging

FMTIMS ((SYSTEM,MIN), (LOG,MIN))

## Other problems

If you suspect that the failure was in VSAM, you do not need to run AMBLIST to secure a listing of VSAM modules IDA019L1 and IDA0192A of the failing system. Data Facility Products (DFP) formats the entry points for these modules. IMS includes LPA modules in offline dump data sets only if LPALIB is listed in the SDUMP options for your system. However, this is not recommended because the LPA modules occupy so much space in the dump data sets.

*z/OS MVS Diagnosis: Tools and Service Aids* describes how to generate a z/OS trace.

### Dump contents returned for different FMTIMS options

You can specify different FMTIMS options to add different types of information to a formatted IMS system dump.

The options are listed in alphabetical order. FMTIMS options can be specified on the FMTIMS statement in any order. The requested options are printed in the order stated under [“Formatted dump output order” on page 593](#).

Some options state they "are ignored for batch." If the dump was taken because batch processing (IMS DB or CICS) failed, the control blocks for these options are either meaningless or not included in the dump data set. Therefore, the control blocks are not formatted even if you specify that option on the FMTIMS statement.

Most options can be specified with the MIN qualifier. Whenever possible, specify this qualifier to reduce the number of control blocks formatted. You can always format the dump data set again if you need the additional information.

### ALL

Causes a full, formatted dump.

(ALL,MIN) formats the dump as if each option were specified with the MIN qualifier.

**AOI**

Formats the storage for the Type 2 Automated Operator Control blocks.

**AUTO**

Provides an optimal subset of the IMS dump formatting options without having to first analyze the dump and without having to understand the content or use of all of the IMS dump formatting options.

This option uses the failing ITASK type information to choose one of the formatter's functional areas, and selects the appropriate dump formatter options.

**CBT**

Formats storage management area control blocks, including:

- Control Block Table Header
- Individual Control Block Table entries

Output is the same if (CBT,MIN) is specified.

**CBTE,cbteid**

Formats all the IPAGEs for the identified CBTE type (cbteid), including:

- Individual Control Block Table entries
- All IPAGE storage of the requested CBTE type

For example, if you specify (CBTE,DPST), all DPST IPAGEs are formatted.

This option can be repeated as needed and has no defaults. The requested IPAGEs must be part of the dump data set. MIN is not valid for the CBTE option.

**CLB/LLB**

Permits formatting of an individual Communication Line Block or Link Line Block and its subordinate blocks. Select this option by the following:

- Address
- Node name
- LTERM name
- Communication ID

Select the LLB by address or link number.

The CLB/LLB format creates eye catchers and index entries similar to the following:

```

**CLB/LLB          REQUESTED CLB/LLB
  
```

**DB**

Formats areas and control blocks used for IMS Database functions. The following table shows the areas formatted under the (DB) and (DB,MIN) FMTIMS options.

*Table 239. Formatted areas under the FMTIMS options DB and DB,MIN*

| <b>(DB)</b>                              | <b>(DB,MIN)</b>               |
|------------------------------------------|-------------------------------|
| PSB Directory                            | same                          |
| DMB Directory                            | same                          |
| Intent List                              | not formatted                 |
| BFSP                                     | same                          |
| DL/I Trace                               | same                          |
| Fast Path Trace (if Fast Path is active) | same                          |
| OSAM Pool Control Blocks and buffers     | OSAM Pool Control Blocks only |
| Program Isolation blocks                 | same                          |

Table 239. Formatted areas under the FMTIMS options DB and DB,MIN (continued)

| (DB)                                                                                                                                                                              | (DB,MIN)                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| All PSTs and related control blocks, including PCBs, SDBs, Savearea set, alternate DL/I DECB, DSGLRKEY, hierarchical holder, delete work area, RPLI, VSAM PLH, and retrieve trace | Active PSTs, with the same related control blocks                                                          |
| If Fast Path is present: EPSTs and related control blocks, including EPCBs, ESRTs, EMHBs, message buffers, XCRBs, DMHRs, and DEDB buffers                                         | If Fast Path is present: EPSTs and related control blocks, including EPCBs, ESRTs, EMHBs, XCRBs, and DMHRs |
| VSAM buffer pool control blocks                                                                                                                                                   | same                                                                                                       |
| RLPL for IRLM requests                                                                                                                                                            | same                                                                                                       |

In a DL/I–SAS environment, DPST formatting does not format related control blocks if the DL/I address space was not included in the dump data set.

### DBRC

Formats records used by DBRC in its processing, including:

- DFSRCWKB block
- DFSBRLSB block
- Dump Router storage
- Global Data block
- GDBDLTAR block
- GDBDSAAR block
- GDBRECAR block
- GDBLISAR block
- DSPEXIAG block
- DSPEXOPM block
- VFYWSPAC block
- DSPOCPAG block
- DSPJCLAR block
- GDBGPDAR block
- GDBRUPAR block
- GDBOLCAR block
- GDBMNPTR block
- GDBESAVE block
- GDBISAVE block
- GDBCSAVE block
- GDBRSAVE block
- DSPCMPAG block
- DSPVFILE block
- DBRC Internal Trace

Output is the same if (DBRC,MIN) is specified. DBRC blocks must be present in the dump data set to be formatted.

## DC

Formats the data communication areas listed in the following table. This option is skipped if the CTL address space is not included in the dump data set.

Table 240. Data communication areas formatted by DC and DC,MIN

| (DC)                                                                                                                                                                                                                                                                                                                                                                         | (DC,MIN) <sup>1</sup>                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| All CLBs, LXBs, and LCBs, with subordinate control blocks: <ul style="list-style-type: none"><li>• Current CTB or LTB, and CNT</li><li>• Allocated I/O buffers</li><li>• CIB, if using MFS processing</li><li>• CCB, if using conversational processing</li><li>• MFS work buffers</li><li>• ECNT, EMHB, and message buffer, if the CTB shows a Fast Path terminal</li></ul> | Active CLBs, LXBs, and LCBs, with the same subordinate control blocks except that current CTB or LTB and CNT are not formatted. |
| SMB table                                                                                                                                                                                                                                                                                                                                                                    | not formatted                                                                                                                   |
| CTT table                                                                                                                                                                                                                                                                                                                                                                    | not formatted                                                                                                                   |
| SPQBs and the CNTs chained off unallocated SPQBs                                                                                                                                                                                                                                                                                                                             | not formatted                                                                                                                   |

### Note:

1. (DC,MIN) formats control blocks only for those lines, nodes, and links that meet at least one of the following criteria:
  - a. MSC links
  - b. Nodes in OPNDST or CLSDST processing
  - c. Lines or nodes with allocated input, output, or receive any buffers
  - d. CLBs that have an active SAP

Both DC options are ignored for batch.

## DEDB

Formats the DEDB control blocks and areas. The areas included are listed in the following table.

Table 241. DEDB control block areas formatted by DEDB and DEDB,MIN

| (DEDB)                                      | (DEDB,MIN)           |
|---------------------------------------------|----------------------|
| ALDS                                        | same                 |
| DMCBs, SGTs, FDTs, and MRMBs for open DEDBs | same                 |
| DMACs and ADSC for open DEDB areas          | same                 |
| XCRBs, DMHRs, and buffers                   | XCRBs and DMHRs only |
| SRBs and ESRBs                              | same                 |

## DISPATCH

Formats areas relating to the IMS Dispatcher and its functions. The following table shows the areas formatted under this FMTIMS option.



Table 242. Areas formatted by DISPATCH and DISPATCH,MIN

| <b>(DISPATCH)</b>     | <b>(DISPATCH,MIN)</b> |
|-----------------------|-----------------------|
| Dispatcher work areas | not formatted         |
| Dispatcher Trace      | same                  |
| Scheduler Trace       | not formatted         |
| Latch Trace           | same                  |

(DISPATCH,MIN) is ignored for batch.

**DPST,jobname**

**DPST,N,dependent region number**

**DPST,A,address**

Permits formatting of an individual Dependent Region Partition Specification Table and its subordinate blocks for PSTs related to MPPs, BMPs, IFPs, and batch DL/I. You can specify one of the following choices:

- job name
- Dependent region number
- DPST address

Output follows the DB formatting output in the dump formatter. The eye catchers and index entries appear as follows:

|         |                 |
|---------|-----------------|
| **DPSTS | REQUESTED DPSTS |
|---------|-----------------|

**EMH**

Formats the Expedited Message Handler areas that are used by IMS Fast Path, as shown in the following table. The CTL address space must be included in the dump data set for this option to be formatted.

Table 243. Areas formatted by EMH and EMH,MIN

| <b>EMH</b>                        | <b>EMH,MIN</b>       |
|-----------------------------------|----------------------|
| RCTEs                             | same                 |
| BALGs, EMHBs, and message buffers | BALGs and EMHBs only |

**LOG**

Formats control blocks and areas used by the IMS logger. The areas included shown in the following table. These areas, except for the WADS and the DLOG trace, are repeated in the dump when the IMS Monitor is active.

Table 244. Areas formatted by LOG and LOG,MIN

| <b>LOG</b>                                                   | <b>LOG,MIN</b>   |
|--------------------------------------------------------------|------------------|
| LCD                                                          | same             |
| Restart Log Work Area                                        | same             |
| WADS and the data necessary to manage it                     | WADS only        |
| OLDS prefix and the buffer associated with it                | OLDS prefix only |
| Log DSET, which defines all OLDS currently available for use | same             |
| Message work areas and Logger message areas                  | same             |

---

Table 244. Areas formatted by LOG and LOG,MIN (continued)

---

| <b>LOG</b> | <b>LOG,MIN</b> |
|------------|----------------|
| DLOG trace | same           |

---

### **MSDB**

Formats the Main Storage Databases used by IMS Fast Path. The areas included are listed in the following table.

---

Table 245. Main storage databases formatted by MSDB and MSDB,MIN

---

| <b>MSDB</b>  | <b>MSDB,MIN</b> |
|--------------|-----------------|
| MSDB headers | same            |
| all MSDBs    | not formatted   |

---

### **POOL, NAME, poolid**

Invokes formatting of the storage manager control blocks and the pool storage for any of the following pools:

- ALL
- CESS
- CIOP
- DBWP
- DLDAP
- DLMP
- DPSB
- EMHB
- EPCB
- FPWP
- HIOP
- MFBP
- PSBW
- QBFL
- QBUF
- SPAP
- LUMC
- LUMP

NAME is an optional keyword indicating the pool name parameter. If NAME is omitted, the first parameter is assumed to be the pool name.

The poolid is a required 4-character pool name of an existing storage manager pool or the keyword ALL. If ALL is specified, the following storage pools are formatted:

- HIOP
- CIOP
- CESS
- SPAP
- EMHB
- FPWP
- QBUF

- QBFL
- DLMP
- DPSB
- DBWP
- MFBP
- EPCB
- LUMP
- LUMC

ALL triggers the formatting of any storage manager trace table entries along with the storage manager control blocks and pool storage.

MIN is an optional keyword. If MIN is specified for one of the dynamic pools (HIOP, CIOP, EMHB, FPWP, CESS, SPAP, LUMC, LUMP) only the storage manager pool header and block headers are formatted. If MIN is omitted, the pool header control block is formatted along with the blocks and block headers representing the dynamic storage pool.

## QM

Formats the control blocks and areas of the IMS queue manager. The formatter skips this option if the CTL address space is not included in the dump data set. The areas included are shown in the following table.

*Table 246. Areas formatted by QM and QM,MIN*

| QM                  | QM,MIN        |
|---------------------|---------------|
| Qpool Prefix        | same          |
| Qpool Buffer Prefix | same          |
| Qpool Buffer        | not formatted |

Both QM options are ignored for batch.

## RESTART

Formats the IMS restart control blocks and related areas, including:

- Checkpoint ID table
- SIDXs and their subordinate blocks:
  - All LCREs for the SIDX entry being processed
  - All RREs for the SIDX entry being processed
- All RPSTs for the SIDX entry being processed
- FRB, if present

Output is the same if (RESTART,MIN) is specified. Both RESTART options are ignored for batch.

## SAP, ECBADR, ecbaddr

### SAP, ADDRESS, sapaddr

The SAP option can be invoked using either the SAP address or the SAP's ECB address (providing that the ECB is a valid ITASK and has a prefix pointing to a SAP). The SAP option request can be placed either on the IMSDUMP verb line after FMTIMS or in the DFSFRMAT data set. The following examples show SAP option requests:

```
VERBX IMSDUMP 'imsjname,II,N,FMTIMS (SAP,ADDRESS,20864C0) '
```

```
VERBX IMSDUMP 'imsjname,FMTIMS SCD,(SAP,ECBADR,3064250) '
```

For compatibility reasons, the MIN qualifier is allowed, but the output is the same. Individual SAP option formatting is also available on the IMS Low Level panel of the IMS IMS Dump Formatter dialog. The ADDRESS parameter can be omitted because ADDRESS is the default TYPE for the SAP option.

Individual SAP/save area formatting allows complete formatting of SAP/save areas when additional information is required. The output from individual SAP formatting is the same as the SAVEAREA option output. Individual SAP formatting provides the following eye catcher/index entry:

```
**SAPS      REQUESTED SAPS
```

## SAVEAREA

Formats the save area information, including:

- Formatted SAPs and any UEHBs anchored off the SAPs.

**Restriction:** The UEHBs cannot be formatted if the CTL address space is not included in the dump data set.

- Formatted Save Area Sets associated with each SAP.
- Unformatted dump of the IPAGEs containing the SAPs.

If the DL/I address space is not in the data set, then the DL/I SAPs are not formatted. If the CTL address space is not in the data set, then the non-DL/I SAPs are not formatted. Output is the same if (SAVEAREA,MIN) is specified. Both SAVEAREA options are ignored for batch.

The SAVEAREA also comes with a summary option that allows a faster overview scan of the IMS ITASK status within a dump. The SAVEAREA SUMmary output reduces the SAP/Savearea formatting to minimal data while adding keyword scan capability and automatic computation of the exit offsets. This reduces keystroke resources required to overview the ITASK status and ITASK module flow. The SAVEAREA SUMmary and individual SAP formatting provides the following eye catcher/index entry:

```
**SSS      SAP/SAVE CONDENSED SUMMARY
```

SAVEAREA SUMmary formatting contains the following scannable keywords with their associated meanings:

### RUN

ITASKs that are active are given a RUN indicator. Abend and loop analysis is usually concerned only with running ITASKs.

### LATCHREQ

ITASKs that are waiting for an IMS SLX latch (not checkpoint restart LATE latches) are given a LATCHREQ indicator. Enabled wait problem analysis often requires analyzing ITASKs that are waiting for latches.

### LATCHOWN

ITASKs that own an IMS SLX latch (not checkpoint restart LATE latches) are given a LATCHOWN indicator. Enabled wait problem analysis often requires analyzing ITASKs that own SLX latches.

### ITASK type

The ITASK type is in the summary and is scannable. The ITASK type names are not at the end of the scan list, however. The ITASK type is preceded by the label "type". The possible type names can be gotten from the DFSCIR macro prolog.

## SB

Formats the control blocks, areas, and buffers of the Sequential Buffering function (SB) of IMS. This option also formats those DL/I control blocks which are important for debugging the SB function.

The SB information is divided into four sections. The following table shows which sections are formatted with the SB and SB,MIN options. .

| <i>Table 247. Sections formatted by SB and SB,MIN</i> |        |
|-------------------------------------------------------|--------|
| SB                                                    | SB,MIN |
| Subsystem overview                                    | same   |

Table 247. Sections formatted by SB and SB,MIN (continued)

| <b>SB</b>                   | <b>SB,MIN</b>     |
|-----------------------------|-------------------|
| PST overview <sup>1</sup>   | same <sup>2</sup> |
| Sorted blocks <sup>1</sup>  | same <sup>2</sup> |
| Sorted buffers <sup>1</sup> | not formatted     |

**Note:**

1. The DL/I address space must be included in the dump data set for these areas to be formatted.
2. Formatted only if you requested a conditional SB activation for that application or PST.

The SB information is divided into the following sections:

1. Subsystem Overview of SB—provides an overview of SB control blocks from an IMS subsystem point-of-view. The SDCBs appear in the order in which they are anchored in the SBSCD. Each SDCB is followed by its SDSGs. The section contains the following information:
  - SB section of the SCD
  - SBSCD, including the SBHE blocks
  - SDCBs
  - SDSGs
2. PST Overview of SB—formats the SB control blocks (and other IMS control blocks significant to SB) for each active PST. These blocks are sorted in hierarchical order. For example, the first DBPCB and its JCB, DSGs, EDSGs, and SDSGs; then the second DBPCB with its subordinate blocks, and so on. The section contains the following information:
  - SB and buffer-handler sections of the PST
  - PST DECB prefix
  - SB extensions to the PST
  - SB work area
  - SBPARMS
  - DBPCBs and their JCBs, DSGs, ESDGs, and SDSGs
3. Sorted SB Blocks—contains SB control blocks (and other IMS control blocks significant to SB) sorted according to their virtual storage address. The section contains the following information:
  - DBPCBs
  - DCB with its OSAM extensions
  - DSGs
  - ESDGs
  - JCBs
  - OV-IO DECB prefix
  - PST DECB prefix
  - SB extensions to DCBs
  - SB extensions to DSGs
  - SB extensions to the PST
  - SB work area
  - SBPARMS
  - SBUFs
  - SCARs

- SRANs
4. Sorted SB Buffers—contains the SB buffers of each SB buffer pool. The SB buffers of one SB buffer pool are contiguous in storage and are formatted as one entity. The buffer pools are then sorted by virtual storage address.

### SCD

Formats the IMS SCD and related areas. The areas included are listed in the following table.

*Table 248. Areas formatted by SCD and SCD,MIN*

| <b>(SCD)</b>                                             | <b>(SCD,MIN)</b> |
|----------------------------------------------------------|------------------|
| SCD                                                      | same             |
| Latch Extensions                                         | same             |
| Scheduler Sequence Queues                                | not formatted    |
| Synchronous APPC/OTMA Shared Message Queue SCD Extension | same             |
| Fast Path SCD Extension, if Fast Path is active          | same             |
| Formatted dumps of the batch key 7 SCD                   | same             |
| LU 6.2 SCD extension                                     | same             |

### SPST

Formats the system PSTs, which are ITASKs used by IMS. This includes:

- Global system PSTs
- Local control region address space PSTs
- Local DL/I address space PSTs
- Areas related to the above PSTs, including LWA and IRLMA

Some SPSTs are not formatted if the CTL address space is not in the dump data set. Output is the same if (SPST,MIN) is specified. Both SPST options are ignored for batch.

### SUBS

Formats the areas and control blocks that IMS uses to manage subsystems, including:

- Subsystem trace
- Global ESET block

Output is the same if (SUBS,MIN) is specified. Both SUBS options are ignored for batch.

### SUMMARY

Formats the current diagnostic section.

The SUMMARY data areas are not formatted if the SDWA address space is not part of the dump data set. (For abends and batch processing, the SDWA address is saved by the ESTAE module. For online processing, the dump must be taken by DFSOFMD0, and the SDWA parameter must be passed at DFSDUMP time.)

The areas formatted with this option include:

- Failing PSW
- Abend code
- Module name
- Registers at time of abend
- 256 byte instruction area—128 bytes above and below the failing PSW
- 16 register storage areas—512 bytes above and 256 bytes below the registers at time of abend

- SDWA address space of IMS
- Failing SAP and its UEHB
- Failing ITASK when the ITASK is a DPST, system PST, CLB, or LLB (dependent region errors, some systems services errors, terminal process errors, and MSC errors)

The SUMMARY option names the ITASK type when it is determined, even if it is not one of the ITASK types that provide for additional formatting. The ITASK type name is two to four characters. If it is unknown, the type name is "UNKN".

Output is the same if (SUMMARY,MIN) is specified.

### **SYSPST**

Permits formatting of an individual system partition specification table and some of its subordinate blocks. Select this option by address or system PST name. This option creates eye catchers and index entries similar to the following:

```
**SYSPSTS                REQUESTED SYSTEM PSTS
```

### **SYSTEM**

Formats the SUMMARY, SAVEAREA, and SCD areas as one group. The areas and control blocks formatted are the same as if each of the options were invoked separately.

(SYSTEM,MIN) is formatted as though each of the options were specified with MIN.

See the individual options for a list of the areas formatted.

### **TRACE, NAME, table-id**

Gets a new search module that invokes the normal trace format control module (DFSATRA0) to format trace tables separately. This option enables viewing of trace table data without having to format the entire option that usually includes the formatted trace table. The TRACE option request uses the 2-character trace table EBCDIC ID code from the Trace Selection panel. The IMS Dump Formatter ISPF panels also accept an option of "ALL" to format all IMS trace table traces. The IMS Dump Formatter dialog TRACE SELECTION panel provides a selectable list of IMS trace tables with the trace name, internal ID, and description. The following examples are TRACE format requests, followed by comments for each. In each case, the NAME keyword can be omitted because NAME is the default TYPE parameter. The following example is a request for the DL/I trace table.

```
FMTIMS... (TRACE, NAME, DL), ...
```

The following is a request for the dispatcher trace table and the DL/I trace table with a MIN option that is ignored.

```
FMTIMS... , (TRACE, NAME, DL, MIN), (TRACE, NAME, DS) ...
```

### **UTIL**

Formats the control blocks for the IMS Partial Database Reorganization utility, including:

- Common area
- Database table
- Segment table
- Action table

The output is the same if (UTIL,MIN) is specified. Both UTIL options are ignored for batch.

### **Related concepts**

[“Dump formatting options” on page 598](#)

General formatting options are available for IMS and z/OS memory dumps.

### **Invoking the IMS Offline Dump Formatter under IPCS**

You can invoke the Offline Dump Formatter under IPCS by using a VERBX command or by using menus.

#### ***Using a VERBX command***

Enter FMTIMS and the valid IMS format options after the job name and any refresh, debug, half line, and nonheader options. The following is an example.

```
VERBX IMSDUMP, 'imsname,D,H,R,FMTIMS (SAP,ADDRESS,1234580)'
```

## Syntax restrictions on the FMTIMS statement

The format control data set requires adherence to ten syntax rules, but the sequence in which you apply the rules does not matter.

The control statements in the format control data set must follow the following syntax rules:

- The first record must contain "FMTIMS".
- A comma (,) must separate parameters from their qualifiers (MIN or cbteid).
- The number of leading blanks on both the initial record and on subsequent records is not limited.
- The last 8 bytes of all records are ignored by the formatter; you can use them for sequence numbers or any other purpose.
- A comma after the last parameter on any record indicates continuation to the next record. You can split a parameter and its qualifier, but you cannot split the spelling of a parameter over two records. For example:

```
FMTIMS ((SYSTEM,MIN), (LOG,  
MIN))
```

is acceptable, but the following is not:

```
FMTIMS ((SYS  
TEM,MIN), (LOG,MIN))
```

Notice that you can insert blanks between the last parameter in a record and the end of that record.

- The order in which the options are specified in the control statement data set has no effect on the dump formatting output order.
- Blanks imbedded within the parameters on a given record cause the formatter to assume the control statement is ended.
- The options can be uppercase or lowercase EBCDIC; they are translated to uppercase before being processed.
- Options can be specified by any unique number of the option's lead characters. If a non-unique abbreviation is passed, the first matching option is chosen. The FMTIMS verb cannot be abbreviated.
- Enclose an option that has a qualifier in parentheses.

## Contents formatted for FMTIMS options

FMTIMS options can be specified on the FMTIMS statement in any order.

### Contents formatted for FMTIMS options

The options are listed in alphabetical order.

Some options state they "are ignored for batch." If the dump was taken because batch processing (IMS DB or CICS) failed, the control blocks for these options are either meaningless or not included in the dump data set. Therefore, the control blocks are not formatted even if you specify that option on the FMTIMS statement.

Most options can be specified with the MIN qualifier. Whenever possible, specify this qualifier to reduce the number of control blocks formatted. You can always format the dump data set again if you need the additional information.

#### **ALL**

Causes a full, formatted dump.



(ALL,MIN) formats the dump as if each option were specified with the MIN qualifier.

#### **AOI**

Formats the storage for the Type 2 Automated Operator Control blocks.

#### **AUTO**

Provides an optimal subset of the IMS dump formatting options without having to first analyze the dump and without having to understand the content or use of all of the IMS dump formatting options.

This option uses the failing ITASK type information to choose one of the formatter's functional areas, and selects the appropriate dump formatter options.

#### **CBT**

Formats storage management area control blocks, including:

- Control Block Table Header
- Individual Control Block Table entries

Output is the same if (CBT,MIN) is specified.

#### **CBTE,cbteid**

Formats all the IPAGEs for the identified CBTE type (cbteid), including:

- Individual Control Block Table entries
- All IPAGE storage of the requested CBTE type

For example, if you specify (CBTE,DPST), all DPST IPAGEs are formatted.

This option can be repeated as needed and has no defaults. The requested IPAGEs must be part of the dump data set. MIN is not valid for the CBTE option.

#### **CLB/LLB**

Permits formatting of an individual Communication Line Block or Link Line Block and its subordinate blocks. Select this option by the following:

- Address
- Node name
- LTERM name
- Communication ID

Select the LLB by address or link number.

The CLB/LLB format creates eye catchers and index entries similar to the following:

```
**CLB/LLB          REQUESTED CLB/LLB
```

#### **DB**

Formats areas and control blocks used for IMS Database functions. The following table shows the areas formatted under the (DB) and (DB,MIN) FMTIMS options.

*Table 249. Formatted areas under the FMTIMS options DB and DB,MIN*

| <b>(DB)</b>              | <b>(DB,MIN)</b> |
|--------------------------|-----------------|
| Data Base Tracker Blocks | same            |
| Coupling Facility Block  | same            |
| PSB Directory            | same            |
| DMB Directory            | same            |
| Intent List              | not formatted   |
| BFSP                     | same            |
| DL/I Trace               | same            |

Table 249. Formatted areas under the FMTIMS options DB and DB,MIN (continued)

| <b>(DB)</b>                                                                                                                                                                       | <b>(DB,MIN)</b>                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Fast Path Trace (if Fast Path is active)                                                                                                                                          | same                                                                                                       |
| OSAM Pool Control Blocks and buffers                                                                                                                                              | OSAM Pool Control Blocks only                                                                              |
| Program Isolation blocks                                                                                                                                                          | same                                                                                                       |
| All PSTs and related control blocks, including PCBs, SDBs, Savearea set, alternate DL/I DECB, DSGLRKEY, hierarchical holder, delete work area, RPLI, VSAM PLH, and retrieve trace | Active PSTs, with the same related control blocks                                                          |
| If Fast Path is present: EPSTs and related control blocks, including EPCBs, ESRTs, EMHBs, message buffers, XCRBs, DMHRs, and DEDB buffers                                         | If Fast Path is present: EPSTs and related control blocks, including EPCBs, ESRTs, EMHBs, XCRBs, and DMHRs |
| VSAM buffer pool control blocks                                                                                                                                                   | same                                                                                                       |
| RLPL for IRLM requests                                                                                                                                                            | same                                                                                                       |

In a DL/I–SAS environment, DPST formatting does not format related control blocks if the DL/I address space was not included in the dump data set.

#### **DBRC**

Formats records used by DBRC in its processing, including:

- DFSRCWKB block
- DFSBRLSB block
- Dump Router storage
- Global Data block
- GDBDLTAR block
- GDBDSAAR block
- GDBRECAR block
- GDBLISAR block
- DSPEXIAG block
- DSPEXOPM block
- VFYWSPAC block
- DSPOCPAG block
- DSPJCLAR block
- GDBGPDAR block
- GDBRUPAR block
- GDBOLCAR block
- GDBMNPTR block
- GDBESAVE block
- GDBISAVE block
- GDBCSAVE block
- GDBRSAVE block
- DSPCMPAG block
- DSPVFILE block
- DBRC Internal Trace

Output is the same if (DBRC,MIN) is specified. DBRC blocks must be present in the dump data set to be formatted.

## DC

Formats the data communication areas listed in the following table. This option is skipped if the CTL address space is not included in the dump data set.

*Table 250. Data communication areas formatted by DC and DC,MIN*

| <b>(DC)</b>                                                                                                                                                                                                                                                                                                                                                                         | <b>(DC,MIN)<sup>1</sup></b>                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| All CLBs, LXBs, and LCBs, with subordinate control blocks: <ul style="list-style-type: none"> <li>• Current CTB or LTB, and CNT</li> <li>• Allocated I/O buffers</li> <li>• CIB, if using MFS processing</li> <li>• CCB, if using conversational processing</li> <li>• MFS work buffers</li> <li>• ECNT, EMHB, and message buffer, if the CTB shows a Fast Path terminal</li> </ul> | Active CLBs, LXBs, and LCBs, with the same subordinate control blocks except that current CTB or LTB and CNT are not formatted. |
| SMB table                                                                                                                                                                                                                                                                                                                                                                           | not formatted                                                                                                                   |
| CTT table                                                                                                                                                                                                                                                                                                                                                                           | not formatted                                                                                                                   |
| SPQBs and the CNTs chained off unallocated SPQBs                                                                                                                                                                                                                                                                                                                                    | not formatted                                                                                                                   |

### Note:

1. (DC,MIN) formats control blocks only for those lines, nodes, and links that meet at least one of the following criteria:
  - a. MSC links
  - b. Nodes in OPNDST or CLSDST processing
  - c. Lines or nodes with allocated input, output, or receive any buffers
  - d. CLBs that have an active SAP

Both DC options are ignored for batch.

## DEDB

Formats the DEDB control blocks and areas. The areas included are listed in the following table.

*Table 251. DEDB control block areas formatted by DEDB and DEDB,MIN*

| <b>(DEDB)</b>                               | <b>(DEDB,MIN)</b>    |
|---------------------------------------------|----------------------|
| ALDS                                        | same                 |
| DMCBs, SGTs, FDTs, and MRMBs for open DEDBs | same                 |
| DMACs and ADSC for open DEDB areas          | same                 |
| XCRBs, DMHRs, and buffers                   | XCRBs and DMHRs only |
| SRBs and ESRBs                              | same                 |

## DISPATCH

Formats areas relating to the IMS Dispatcher and its functions. The following table shows the areas formatted under this FMTIMS option.

Table 252. Areas formatted by DISPATCH and DISPATCH,MIN

| <b>(DISPATCH)</b>     | <b>(DISPATCH,MIN)</b> |
|-----------------------|-----------------------|
| Dispatcher work areas | not formatted         |
| Dispatcher Trace      | same                  |
| Scheduler Trace       | not formatted         |
| Latch Trace           | same                  |

(DISPATCH,MIN) is ignored for batch.

**DPST,jobname**

**DPST,N,dependent region number**

**DPST,A,address**

Permits formatting of an individual Dependent Region Partition Specification Table and its subordinate blocks for PSTs related to MPPs, BMPs, IFPs, and batch DL/I. You can specify one of the following choices:

- job name
- Dependent region number
- DPST address

Output follows the DB formatting output in the dump formatter. The eye catchers and index entries appear as follows:

|         |                 |
|---------|-----------------|
| **DPSTS | REQUESTED DPSTS |
|---------|-----------------|

**EMH**

Formats the Expedited Message Handler areas that are used by IMS Fast Path, as shown in the following table. The CTL address space must be included in the dump data set for this option to be formatted.

Table 253. Areas formatted by EMH and EMH,MIN

| <b>EMH</b>                        | <b>EMH,MIN</b>       |
|-----------------------------------|----------------------|
| RCTEs                             | same                 |
| BALGs, EMHBs, and message buffers | BALGs and EMHBs only |

**LOG**

Formats control blocks and areas used by the IMS logger. The areas included shown in the following table. These areas, except for the WADS and the DLOG trace, are repeated in the dump when the IMS Monitor is active.

Table 254. Areas formatted by LOG and LOG,MIN

| <b>LOG</b>                                                   | <b>LOG,MIN</b>   |
|--------------------------------------------------------------|------------------|
| LCD                                                          | same             |
| Restart Log Work Area                                        | same             |
| WADS and the data necessary to manage it                     | WADS only        |
| OLDS prefix and the buffer associated with it                | OLDS prefix only |
| Log DSET, which defines all OLDS currently available for use | same             |
| Message work areas and Logger message areas                  | same             |

---

Table 254. Areas formatted by LOG and LOG,MIN (continued)

---

| <b>LOG</b> | <b>LOG,MIN</b> |
|------------|----------------|
| DLOG trace | same           |

---

### **MSDB**

Formats the Main Storage Databases used by IMS Fast Path. The areas included are listed in the following table.

---

Table 255. Main storage databases formatted by MSDB and MSDB,MIN

---

| <b>MSDB</b>  | <b>MSDB,MIN</b> |
|--------------|-----------------|
| MSDB headers | same            |
| all MSDBs    | not formatted   |

---

### **POOL, NAME, poolid**

Invokes formatting of the storage manager control blocks and the pool storage for any of the following pools:

- AIOP
- ALL
- CESS
- CIOP
- CMDP
- DBWP
- DLDP
- DLMP
- DPSB
- DYNP
- EMHB
- EPCB
- FPWP
- HIOP
- MFBP
- PSBW
- QBFL
- QBUF
- SPAP
- LUMC
- LUMP

NAME is an optional keyword indicating the pool name parameter. If NAME is omitted, the first parameter is assumed to be the pool name.

The poolid is a required 4-character pool name of an existing storage manager pool or the keyword ALL. If ALL is specified, the following storage pools are formatted:

- AIOP
- HIOP
- CIOP
- CMDP

- CESS
- DYNP
- SPAP
- EMHB
- FPWP
- QBUF
- QBFL
- DLMP
- DPSB
- DBWP
- MFBP
- EPCB
- LUMP
- LUMC

ALL triggers the formatting of any storage manager trace table entries along with the storage manager control blocks and pool storage.

MIN is an optional keyword. If MIN is specified for one of the dynamic pools (AOIP, CESS, CIOP, CMDP, DYNP, EMHB, FPWP, HIOP, LUMC, LUMP, or SPAP) only the storage manager pool header and block headers are formatted. If MIN is omitted, the pool header control block is formatted, along with the blocks and block headers that represent the dynamic storage pool.

## QM

Formats the control blocks and areas of the IMS queue manager. The formatter skips this option if the CTL address space is not included in the dump data set. The areas included are shown in the following table.

*Table 256. Areas formatted by QM and QM,MIN*

| QM                  | QM,MIN        |
|---------------------|---------------|
| Qpool Prefix        | same          |
| Qpool Buffer Prefix | same          |
| Qpool Buffer        | not formatted |

Both QM options are ignored for batch.

## RESTART

Formats the IMS restart control blocks and related areas, including:

- Checkpoint ID table
- SIDXs and their subordinate blocks:
  - All LCREs for the SIDX entry being processed
  - All RREs for the SIDX entry being processed
- All RPSTs for the SIDX entry being processed
- FRB, if present

Output is the same if (RESTART,MIN) is specified. Both RESTART options are ignored for batch.

## SAP, ECBADR, ecbaddr

## SAP, ADDRESS, sapaddr

The SAP option can be invoked using either the SAP address or the SAP's ECB address (providing that the ECB is a valid ITASK and has a prefix pointing to a SAP). The SAP option request can be placed

either on the IMSDUMP verb line after FMTIMS or in the DFSFRMAT data set. The following examples show SAP option requests:

```
VERBX IMSDUMP 'imsjname,II,N,FMTIMS (SAP,ADDRESS,20864C0) '
```

```
VERBX IMSDUMP 'imsjname,FMTIMS SCD,(SAP,ECBADR,3064250) '
```

For compatibility reasons, the MIN qualifier is allowed, but the output is the same. Individual SAP option formatting is also available on the IMS Low Level panel of the IMS IMS Dump Formatter dialog. The ADDRESS parameter can be omitted because ADDRESS is the default TYPE for the SAP option.

Individual SAP/save area formatting allows complete formatting of SAP/save areas when additional information is required. The output from individual SAP formatting is the same as the SAVEAREA option output. Individual SAP formatting provides the following eye catcher/index entry:

```
**SAPS      REQUESTED SAPS
```

## SAVEAREA

Formats the save area information, including:

- Formatted SAPs and any UEHBs anchored off the SAPs.

**Restriction:** The UEHBs cannot be formatted if the CTL address space is not included in the dump data set.

- Formatted Save Area Sets associated with each SAP.
- Unformatted dump of the IPAGEs containing the SAPs.

If the DL/I address space is not in the data set, then the DL/I SAPs are not formatted. If the CTL address space is not in the data set, then the non-DL/I SAPs are not formatted. Output is the same if (SAVEAREA,MIN) is specified. Both SAVEAREA options are ignored for batch.

The SAVEAREA also comes with a summary option that allows a faster overview scan of the IMS ITASK status within a dump. The SAVEAREA SUMmary output reduces the SAP/Savearea formatting to minimal data while adding keyword scan capability and automatic computation of the exit offsets. This reduces keystroke resources required to overview the ITASK status and ITASK module flow. The SAVEAREA SUMmary and individual SAP formatting provides the following eye catcher/index entry:

```
**SSS      SAP/SAVE CONDENSED SUMMARY
```

SAVEAREA Summary formatting contains the following scannable keywords with their associated meanings:

### RUN

ITASKs that are active are given a RUN indicator. Abend and loop analysis is usually concerned only with running ITASKs.

### LATCHREQ

ITASKs that are waiting for an IMS SLX latch (not checkpoint restart LATE latches) are given a LATCHREQ indicator. Enabled wait problem analysis often requires analyzing ITASKs that are waiting for latches.

### LATCHOWN

ITASKs that own an IMS SLX latch (not checkpoint restart LATE latches) are given a LATCHOWN indicator. Enabled wait problem analysis often requires analyzing ITASKs that own SLX latches.

### ITASK type

The ITASK type is in the summary and is scannable. The ITASK type names are not at the end of the scan list, however. The ITASK type is preceded by the label "type". The possible type names can be gotten from the DFSCIR macro prolog.

## SB

Formats the control blocks, areas, and buffers of the Sequential Buffering function (SB) of IMS. This option also formats those DL/I control blocks which are important for debugging the SB function.

The SB information is divided into four sections. The following table shows which sections are formatted with the SB and SB,MIN options.

*Table 257. Sections formatted by SB and SB,MIN*

| <b>SB</b>                   | <b>SB,MIN</b>     |
|-----------------------------|-------------------|
| Subsystem overview          | same              |
| PST overview <sup>1</sup>   | same <sup>2</sup> |
| Sorted blocks <sup>1</sup>  | same <sup>2</sup> |
| Sorted buffers <sup>1</sup> | not formatted     |

**Note:**

1. The DL/I address space must be included in the dump data set for these areas to be formatted.
2. Formatted only if you requested a conditional SB activation for that application or PST.

The SB information is divided into the following sections:

1. Subsystem Overview of SB—provides an overview of SB control blocks from an IMS subsystem point-of-view. The SDCBs appear in the order in which they are anchored in the SBSCD. Each SDCB is followed by its SDSGs. The section contains the following information:
  - SB section of the SCD
  - SBSCD, including the SBHE blocks
  - SDCBs
  - SDSGs
2. PST Overview of SB—formats the SB control blocks (and other IMS control blocks significant to SB) for each active PST. These blocks are sorted in hierarchical order. For example, the first DBPCB and its JCB, DSGs, EDSGs, and SDSGs; then the second DBPCB with its subordinate blocks, and so on. The section contains the following information:
  - SB and buffer-handler sections of the PST
  - PST DECB prefix
  - SB extensions to the PST
  - SB work area
  - SBPARMS
  - DBPCBs and their JCBs, DSGs, ESDGs, and SDSGs
3. Sorted SB Blocks—contains SB control blocks (and other IMS control blocks significant to SB) sorted according to their virtual storage address. The section contains the following information:
  - DBPCBs
  - DCB with its OSAM extensions
  - DSGs
  - ESDGs
  - JCBs
  - OV-IO DECB prefix
  - PST DECB prefix
  - SB extensions to DCBs
  - SB extensions to DSGs
  - SB extensions to the PST
  - SB work area



- SBPARMS
  - SBUFs
  - SCARs
  - SRANs
4. Sorted SB Buffers—contains the SB buffers of each SB buffer pool. The SB buffers of one SB buffer pool are contiguous in storage and are formatted as one entity. The buffer pools are then sorted by virtual storage address.

## SCD

Formats the IMS SCD and related areas. The areas included are listed in the following table.

*Table 258. Areas formatted by SCD and SCD,MIN*

| <b>(SCD)</b>                                             | <b>(SCD,MIN)</b> |
|----------------------------------------------------------|------------------|
| SCD                                                      | same             |
| Latch Extensions                                         | same             |
| Scheduler Sequence Queues                                | not formatted    |
| Synchronous APPC/OTMA Shared Message Queue SCD Extension | same             |
| Fast Path SCD Extension, if Fast Path is active          | same             |
| Formatted dumps of the batch key 7 SCD                   | same             |
| LU 6.2 SCD extension                                     | same             |

## SPST

Formats the system PSTs, which are ITASKs used by IMS. This includes:

- Global system PSTs
- Local control region address space PSTs
- Local DL/I address space PSTs
- Areas related to the above PSTs, including LWA and IRLMA

Some SPSTs are not formatted if the CTL address space is not in the dump data set. Output is the same if (SPST,MIN) is specified. Both SPST options are ignored for batch.

## SUBS

Formats the areas and control blocks that IMS uses to manage subsystems, including:

- Subsystem trace
- Global ESET block

Output is the same if (SUBS,MIN) is specified. Both SUBS options are ignored for batch.

## SUMMARY

Formats the current diagnostic section.

The SUMMARY data areas are not formatted if the SDWA address space is not part of the dump data set. (For abends and batch processing, the SDWA address is saved by the ESTAE module. For online processing, the dump must be taken by DFSOFMD0, and the SDWA parameter must be passed at DFSDUMP time.)

The areas formatted with this option include:

- Failing PSW
- Abend code
- Module name

- Registers at time of abend
- 256 byte instruction area—128 bytes above and below the failing PSW
- 16 register storage areas—512 bytes above and 256 bytes below the registers at time of abend
- SDWA address space of IMS
- Failing SAP and its UEHB
- Failing ITASK when the ITASK is a DPST, system PST, CLB, or LLB (dependent region errors, some systems services errors, terminal process errors, and MSC errors)

The SUMMARY option names the ITASK type when it is determined, even if it is not one of the ITASK types that provide for additional formatting. The ITASK type name is two to four characters. If it is unknown, the type name is "UNKN".

Output is the same if (SUMMARY,MIN) is specified.

### **SYSPST**

Permits formatting of an individual system partition specification table and some of its subordinate blocks. Select this option by address or system PST name. This option creates eye catchers and index entries similar to the following:

```
**SYSPSTS                REQUESTED SYSTEM PSTS
```

### **SYSTEM**

Formats the SUMMARY, SAVEAREA, and SCD areas as one group. The areas and control blocks formatted are the same as if each of the options were invoked separately.

(SYSTEM,MIN) is formatted as though each of the options were specified with MIN.

See the individual options for a list of the areas formatted.

### **TRACE, NAME, table-id**

Gets a new search module that invokes the normal trace format control module (DFSATRA0) to format trace tables separately. This option enables viewing of trace table data without having to format the entire option that usually includes the formatted trace table. The TRACE option request uses the 2-character trace table EBCDIC ID code from the Trace Selection panel. The IMS Dump Formatter ISPF panels also accept an option of "ALL" to format all IMS trace table traces. The IMS Dump Formatter dialog TRACE SELECTION panel provides a selectable list of IMS trace tables with the trace name, internal ID, and description. The following examples are TRACE format requests, followed by comments for each. In each case, the NAME keyword can be omitted because NAME is the default TYPE parameter. The following example is a request for the DL/I trace table.

```
FMTIMS... (TRACE, NAME, DL), ...
```

The following is a request for the dispatcher trace table and the DL/I trace table with a MIN option that is ignored.

```
FMTIMS... , (TRACE, NAME, DL, MIN), (TRACE, NAME, DS) ...
```

### **UTIL**

Formats the control blocks for the IMS Partial Database Reorganization utility, including:

- Common area
- Database table
- Segment table
- Action table

The output is the same if (UTIL,MIN) is specified. Both UTIL options are ignored for batch.

### **Related reference**

[“Formatted dump contents” on page 589](#)

The title for a formatted dump varies, depending on the parameters provided. The output includes eye catchers and an index to help you locate individual control blocks.

[“Table of control block definitions” on page 70](#)

All of the control blocks are listed, and for each control block the acronyms, macros and descriptions are given.

## Formatted dump contents

The title for a formatted dump varies, depending on the parameters provided. The output includes eye catchers and an index to help you locate individual control blocks.

### Dump title

The contents of the dump titles that are created by the dump assist module (DFSFDMP0) and the initialization routines vary, depending on the internal DFSDUMP parameters provided and the SDUMP errors met.

The following examples show five possible dump title formats.

#### Title format 1

DFSFDMP0 issued the SDUMP and passed the SDWA parameter. The CALLER parameter was either passed to DFSFDMP0 or the routine generated the parameter using the IMS TCB table.

```
ljjjjjjjjj ABEND SYS sss USER uuuu-rrr, DATE.TIME: ddd.tttttt,  
CALLER=cccc, TCB=xxx, MODULE=mmmmmmmm,i
```

*l*

Length of title in hexadecimal - here 91 decimal.

*jjjjjjj*

Job name.

*sss*

System abend code.

*uuuu*

User abend code.

*rrr*

Optional user abend reason code.

*ddd*

Julian day of year.

*ttttt*

Time, in the form HHMMSS.

*cccc*

DFSFDUMP caller parameter or blanks.

*xxx*

Abending TCB or 'UNK'.

*mmmmmmmm*

Abending module or 'UNKNOWN', using the SDWA.

*i*

Indicator if primary (P) or secondary (S) request.

#### Title format 2

DFSFDMP0 issued the SDUMP, but did not have an SDWA. The CALLER parameter was either passed to DFSFDMP0 or the routine generated the parameter by using the IMS TCB table.

```
ljjjjjjjjj DATE.TIME: ddd.tttttt, IMS DUMP REQUESTED,  
CALLER=cccc, TCB=xxx, REASON=rrr,i
```



*rrr...r*

First 8 bytes of the recovery token in characters. It identifies the ID of the CCTL region.

*xxx...x*

Second 8 bytes of the recovery token in hexadecimal.

The possible error messages for mmm . . . m follow. The issuing module precedes the message text.

**DFSPRRA0,**

DBCTL FAILURE DURING DRA TERM

**DFSPRA10,**

DBCTL FAILURE DURING IDENTIFY

**DFSPRA20,**

DBCTL FAILURE DURING RESYNC

**DFSPRA50,**

DBCTL FAILURE DURING PURGE

**DFSPINIO,**

FAILURE ESTABLISHING ESTAE

**DFSPAT00,**

GETMAIN FAILURE

**DFSPINIO,**

SSI FAILURE DURING SONCRT

**DFSPINIO,**

DBCTL FAILURE DURING SONCRT

**DFSPSCHO,**

SSI FAILURE DURING SCHED

**DFSPSCHO,**

DBCTL FAILURE DURING SCHED

**DFSPUSCO,**

SSI FAILURE DURING UNSCHED

**DFSPUSCO,**

DBCTL FAILURE DURING UNSCHED

**DFSPSYNO,**

DBCTL FAILURE DURING SYNC

**DFSPDLIO,**

DBCTL FAILURE DURING DLI

**DFSPPTK0,**

DBCTL FAILURE DURING PRIME

**DFSPTH0,**

SSI FAILURE DURING TERMTHD

**DFSPTH0,**

DBCTL FAILURE DURING TERMTHD

**DFSPRA40,**

PQE CANNOT BE PROCESSED

**DFSPRRA0,**

PQE OR PAPL IS INVALID

**DFSFRA0,**

CONTROL TCB ESTAE INVOKED

**DFSFPA0,**

THREAD TCB ESTAE INVOKED

**DFSFRA0,**

DRA ESTAE FAILED TO ESTABLISH ESTAE

## NO OTHER DRA MESSAGE

### Title format 4

The SNAP call facility identifies calling routines that generate snap dumps. Supervisor call (SVC) dumps are generated only for the intended abend codes or status codes, and for unknown calling routines.

This dump is created by DFSERA20 when a SNAP dump is requested. The title is the format:

```
nnnnnnnn IMS USER ABEND uuuu, DATE.TIME: ddd.tttttt,i
```

#### **nnnnnnnn**

IMS name.

#### **uuuu**

The user abend code or UNK if a SNAP was requested, but there was no abend set.

#### **ddd**

Julian day of year.

#### **ttttt**

Time, in the form HHMMSS

#### **i**

Indicator if primary (P) or secondary (S) requested.

### Title format 5

This dump is created by DFSERA20 when a SNAP dump is requested. The format is generated for dumps that are taken when an unexpected DL/I status code is returned during HALDB Online Reorganization. The title is the format:

```
nnnnnnnn UNEXPECTED STATUS CODE cc, DATE.TIME: ddd.tttttt,i
```

#### **nnnnnnnn**

IMS name.

#### **cc**

The unexpected status code returned during HALDB Online Reorganization.

#### **ddd**

Julian day of year.

#### **ttttt**

Time in the form HHMMSS.

#### **i**

Indicator if primary (P) or secondary (S) requested.

cc is the unexpected status code returned during HALDB Online Reorganization.

### Eye catchers

To help you locate areas that are dumped, eye catchers are printed near the major control blocks in the formatted dump. Eye catchers are also useful when you are using IPCS to view the formatted dump.

Examples of eye catchers are:

#### **\*\*SCD**

System Contents Directory Area

#### **\*\*SSA**

SAP and Save Area

#### **\*\*SB-1**

Subsystem Overview for Sequential Buffering

Eye catchers are also listed at the top of the formatted dump.

## Index

The formatted dump also contains an index at the end that is created by the z/OS Index Service routine. Index entries are created each time an eye catcher is processed during formatting, and after the Offline Dump Formatter finishes processing.

Entry length is limited to 40 decimal characters.

### Formatted dump output order

The following list shows the order in which the Offline Dump Formatter prints control blocks. If you specify **FMTIMS ALL** and all necessary data is available to the formatter, you get all of the areas listed. The order does not change when you specify subset options, but only the areas you specify are formatted. Descriptive information has been added for some control blocks where it is useful.

### ODF Initialization Messages

These messages appear when the formatter is unable to find particular address spaces in the dump data set.

### Eye catchers

Eye catchers of the areas that you requested to be formatted on this pass of the formatter.

An eye catcher could be included in this list even if the Offline Dump Formatter was unable to format the control block, because the list is built from the parameters you include in the FMTIMS statement.

### Diagnostic Area

Contains the PSW, system and user completion codes, save area ID of the module that was executing, and registers in use when abnormal termination occurred.

### Instruction Area

Contains the area of storage from 128 bytes before to 128 bytes after the address of the failing instruction in the PSW.

### Register Area

This area contains 512 bytes above and 256 bytes below each register value in the passed SDWA. The address space ID (ASID) used is the one passed in the SDWA.

### System Diagnostic Work Area

The mapping DSECT is IHASDWA.

### Referenced SAP

The mapping DSECT is ISAP.

### System Contents Directory

The mapping DSECT is ISCD.

### SCD Latch Extension

The mapping DSECT is ISCD.

### Scheduler Sequence Queues

Controls the status of each region. The mapping DSECT is ISCD.

### Synchronous APPC/OTMA Shared Message Queue SCD Extension

The mapping DSECT is DFSCSCD.

### FP ESCD

The mapping DSECT is DBFESCD.

### Control Block Table

Contains entries of control blocks that macro DFSCBTS uses for tracking. The mapping DSECT is DFSCBTS.

### Control Block Table Pools

All IPAGEs for CBTE types requested with the (CBTE,cbteid) option.

### Save Area Trace

### SAPs with their Active UEHBs

**Save Area Prefix**

All SAPs are SNAPed. Each SAP is followed by its save area set. At the end of this section, all of the SAP IPAGEs are dumped.

**IMS Task Dispatch Work Area**

The mapping DSECT is IDSPWRK.

**DBRC Task Dispatch Work Area**

If present in the system, it is mapped.

**IMS Control Task Dispatch Work Area**

Contains the same information as the IMS log task dispatch work area.

**Dependent Region Dispatch Work Area**

For every dependent region in IMS, the dispatcher work area is mapped.

**Dispatcher Trace Data**

DSECT IDSPWRK contains the function codes associated with the dispatcher and an explanation of each code.

**Scheduler Trace Data**

Scheduler trace data is mapped by DFSSCHED. The trace entries contain scheduler function codes.

**Latch Trace Data**

The trace entries contain latch and unlatch function codes. The mapping DSECT is IDLIVSAM TRACENT.

**Timer Work Areas**

These are control blocks used by the internal IMS timers.

**System PSTs**

These are system work areas for any online or batch region. The mapping DSECT is IPST.

**Restart Work Areas**

See RESTART [“Solving IMS problems by using the IMS Offline Dump Formatter”](#) on page 561 for a list of these areas.

**Log Control Directory**

Contains information about the IMS log. The mapping DSECT is LCDSECT.

**Log Work Areas****Log Buffers**

Each log buffer contains buffer information and the log control DECB. The mapping DSECT is LCDSECT.

**Open Record**

Contains the type 06 log record. The mapping DSECT is ILOGREC.

**Control Record**

Contains the type 42 log record. The mapping DSECT is ILOGREC.

**Monitor Log Directory**

Contains the same information as the log control directory.

**DLOG Trace Data**

Trace table used to show IMS logging activity. The mapping DSECT is ILOGREC (67FA).

**Subsystem Control Table****Attach Work Areas****PSB Directory**

A SNAP of the PSB directory. The mapping DSECT is PDIR.

**DMB Directory**

A SNAP of the DMB directory. The mapping DSECT is DDIR.



**Intent List**

The DL/I address space must be in the dump data set for this list to be formatted.

**Fast Path Trace****Dependent Region PST formatting**

For each DPST:

- PST
- Savearea
- PDIR
- Intent List
- PSB prefix
- PSB Index Maintenance, Index I/O, I/O, SSA, and User Parms work areas
- SMB
- DB PCB blocks
- Delete work area
- Retrieve Trace
- HD Space Trace
- FLDS
- RPL
- IRLM area
- PST log work area
- Fast Path EPST and chain addresses, ECNTs, EMH message, EPCBs, XCRBs, and DMHR

**BFSP**

Formats the buffer pool prefix. The mapping DSECT is BFSP.

**BFUS**

Formats the subpool prefix. The mapping DSECT is BFUS. The mapping DSECT is RPLI.

**DL/I Data**

A dump of the DL/I lock activity and program isolation trace table. The mapping DSECT is IDLIVSAM TRACENT.

**Lock Activity Trace Data**

See DL/I Data.

**Program Isolation Data**

Includes the QEL, QCB and REQ areas. The mapping DSECT is XC00.

**OSAM Control Blocks**

The system attempts to follow the main pool, the subpool header, and the buffer prefix, and to dump the buffer. However, if an error is encountered during formatting, the entire buffer pool is SNAPed from the last valid subpool address.

**DL/I Trace Table****Sequential Buffering Blocks**

Sequential Buffering information is grouped into the following four sections. (See the explanation of the (SB) FMTIMS option [“Solving IMS problems by using the IMS Offline Dump Formatter”](#) on page 561 for a complete list of the blocks dumped in each section.)

1. Subsystem Overview for Sequential Buffering
2. PST Overview of Sequential Buffering control blocks
3. Formatted Sequential Buffering control blocks
4. Sequential Buffering buffers

## DEDB Formatting

### Fast Path EMH Formatting

### Fast Path MDSB Formatting

### Communication Line Blocks and Subordinate Blocks <sup>2</sup>

For each CLB line, all the control blocks associated with that line are formatted.

#### CTB <sup>2</sup>

The mapping DSECT is ICLI CTBBASE=0.

#### Input Buffer <sup>2</sup>

A SNAP of the input buffer, if input is active.

#### Output Buffer <sup>2</sup>

A SNAP of the output buffer, if output is active.

#### CCB <sup>2</sup>

Present if a conversation is active or held. The mapping DSECT is ICLI CCBBASE=0.

#### CIB <sup>2</sup>

Present if MFS is in use. The mapping DSECT is ICLI CIBBASE=0.

#### Communication Terminal Table <sup>2</sup>

Defines terminal characteristics. The mapping DSECT is ICLI CTTBASE=0.

#### SPQB Entries <sup>2</sup>

Entries on the subpool queue block chain. Unallocated CNTs are also formatted here.

#### SMB Table <sup>2</sup>

This table defines transaction characteristics in the IMS system. The mapping DSECT is IAPS SMBBASE=0.

#### Queue Manager Pool Prefix and Buffers <sup>2</sup>

The mapping DSECTs are ICLI POOLBASE=0, ICLI BFRBASE=0, and QPOOL. The buffer prefix list contains the address of each buffer's prefix, status byte, and first and last pending and current device relative record number (DRRN).

## Batch Utility Areas

### DBRC Work Areas

### LUM Trace

Allows LU 6.2 activities to be analyzed with the MVS/ESA APPC trace entries by the LU manager.

### Related reference

“Contents formatted for FMTIMS options” on page 578

FMTIMS options can be specified on the FMTIMS statement in any order.

## Edited command buffer format

---

The edited command buffer is logged in the X'02' log record and is passed to the AOI user exit. You can use the edited command buffer to determine if any recoverable commands were issued for the resource you are analyzing.

### Edited command buffer examples

For example, if you are analyzing a hung terminal problem, look at any log records, including X'02' records, that apply to that terminal.

---

<sup>2</sup> These areas are not dumped in a DBCTL environment.

However, finding the applicable log records might be difficult. If the problem is repeatable, you can use the /LOG command to mark the log when certain activities are started or stopped. The /LOG command writes a comment to a X'02' log record. This narrows the range of log records you need to examine.

**Example:** If transaction XYZ results in a hung terminal, use the /LOG command to write a comment to a X'02' log record before the transaction is started and after the terminal is hung, as follows:

```
/LOG START XYZ TRAN THAT RESULTED IN HUNG TERMINAL.
/LOG TERMINAL IS NOW HUNG.
```

Look for these comments in the X'02' log record edited command buffers to determine the range of log records to examine.

The following figure shows the layout of the edited command.

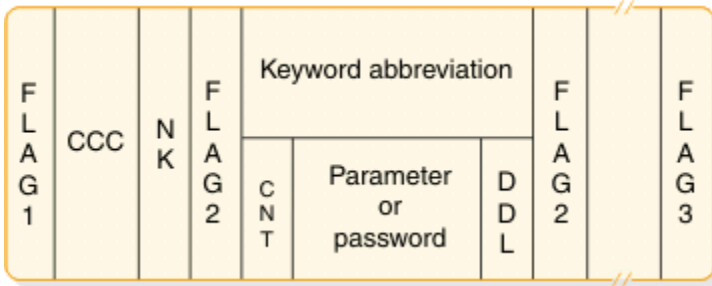


Figure 79. Edited command layout

**Figure Number**  
**Description**

**FLAG1**

X'FE' to denote the beginning of the edited command. If any parameter contains an error, the command action modules set this byte to X'FC'. An exception is DFSICL40 processing of "ALL" expanded parameters.

**CCC**

First 3 characters of entered command.

**NK**

Hexadecimal value of number of keywords in the condensed buffer.

**FLAG2**

One of the following:

**X'FC'**

Parameter that follows found in error.

**X'FF'**

3-byte keyword abbreviation follows.

**X'FE'**

Count (CNT) field and parameter follow.

**C'('**

Count (CNT) field and password follow.

**Keyword Abbreviation**

First 3 characters of entered command. Consult DFSCKWDO to obtain the abbreviation; it is sometimes the first 3 characters of any keyword.

**CNT**

Count of number of characters in parameter or password immediately following the CNT. It can be a comma, period, blank, or left parenthesis.

**Parameter or Password**

Exists exactly as entered from the terminal.

**DDL**

The delimiter entered after the parameter or password. It may be X'80' if the keyword "ALL" was expanded to individual parameters.

**FLAG3**

Period indicating end of command.

**Exception:** Only parameter passwords are present in the condensed buffer; command passwords are not present.

## IMS Dump Formatter

---

The IMS Dump Formatter provides ISPF dialog support for IMS Offline Dump Formatter requests, and simplifies the process of making requests by providing menus for format option selection, help members for online options, automatic terminal and spool output control, and a configuration panel to provide interactive assistance in defining the IMS environment.

The IMS Dump Formatter menu is available from the component analysis section of the IPCS dialogs (IPCS ISPF selection 2.6).

### Dump formatting options

General formatting options are available for IMS and z/OS memory dumps.

- Offline IMS or z/OS formatting from a SYS1.DUMPxx (SDUMP) data set
- Offline IMS or z/OS formatting from a SYSMDUMP data set
- Online IMS or z/OS formatting directed to either a SYSABEND or SYSUDUMP SYSOUT class
- Online z/OS formatting directed to either a SYSABEND or SYSUDUMP spinoff dump SYSOUT class

The dumping options that are in effect in an IMS environment depend on:

- Whether execution is online or batch.
- Whether the error might terminate IMS.
- The FMTO EXEC parameter that is specified.
- The SOD EXEC parameter that is specified (online execution only).
- Whether a SYSABEND, SYSUDUMP, or SYSMDUMP is chosen.
- The z/OS dump options chosen for SDUMP, SYSABEND, SYSUDUMP, and SYSMDUMP.
- Whether the Dump Override Table (DFSFDOT0) contains any entries. DFSFDOT0, and its relationship to the various dumps, is explained in *IMS Version 14 Exit Routines*.

### FMTO options

The FMTO options and their effect on the dumps produced are summarized in the following table, and the following codes are used:

**Option****Effect on dump produced****TE**

Error would terminate IMS.

**NT**

Error would not terminate IMS.

**FDDL**

Formatted dump delete list processing.

**Y**

Yes

**S**

Yes, but only if SDUMP fails.

**N**

No

—

Not applicable, or not attempted.

In the following table:

- The default is FMTO=D.
- SYSABEND, SYSUDUMP, and SYSMDUMP are mutually exclusive.
- z/OS formatting always accompanies IMS online formatting.
- Spinoff dumps can occur in addition to SDUMPs.

Table 259. FMTO options and their effect on memory dumps produced.

| FMTO value | IMS online formatting |    |      | z/OS online formatting |    | IMS offline formatting |    | IMS offline formatting |    | IMS spinoff dump     |    |
|------------|-----------------------|----|------|------------------------|----|------------------------|----|------------------------|----|----------------------|----|
|            | SYSABEND<br>SYSUDUMP  |    |      | SYSABEND<br>SYSUDUMP   |    | SDUMP                  |    | SYSMDUMP               |    | SYSABEND<br>SYSUDUMP |    |
|            | TE                    | NT | FDDL | TE                     | NT | TE                     | NT | TE                     | NT | TE                   | NT |
| D          | S                     | —  | S    | S                      | —  | Y                      | Y  | S                      | —  | —                    | Y  |
| X          | S                     | —  | S    | S                      | —  | Y                      | N  | S                      | —  | —                    | Y  |
| M          | N                     | —  | N    | S                      | —  | Y                      | Y  | S                      | —  | —                    | Y  |
| R          | N                     | —  | N    | S                      | —  | Y                      | N  | S                      | —  | —                    | Y  |
| T          | Y                     | —  | Y    | Y                      | —  | N                      | Y  | Y                      | —  | —                    | Y  |
| P          | Y                     | —  | N    | Y                      | —  | N                      | Y  | Y                      | —  | —                    | Y  |
| F          | Y                     | —  | N    | Y                      | —  | N                      | N  | Y                      | —  | —                    | Y  |
| N          | N                     | —  | N    | Y                      | —  | N                      | Y  | Y                      | —  | —                    | Y  |
| Z          | N                     | —  | N    | Y                      | —  | N                      | N  | Y                      | —  | —                    | Y  |

**SDUMPs**

If SDUMP is used, be aware of these additional considerations:

- If SDUMP is requested by the FMTO option, it is attempted first. If SDUMP is successful, no other dump (except a spinoff dump) is generated.
- If SDUMP fails, if IMS online formatting is requested, and if a SYSABEND or SYSUDUMP DD statement is present, a dump with IMS and z/OS online formatting is generated for terminating errors.

The formatted dump delete list (FDDL) consists of IMS module and control block names, and a dump or delete action indicator. For a module, the delete process removes storage occupied by the module. This causes the module to be omitted from the storage image portion of the dump. However, the module/save ID is printed in the dump. For a control block, the delete process similarly removes storage and storage image output if the block was successfully formatted.

- If SDUMP fails, IMS online formatting is not requested, and a SYSABEND or SYSUDUMP DD statement is present, a dump with z/OS online formatting is generated for terminating errors.
- If SDUMP fails and a SYSMDUMP DD statement is present, a machine readable dump is generated for terminating errors.

## SYSDUMPs

If SYSDUMP is used, be aware of these additional considerations:

- SYSDUMP DD statements should be present in the IMS, DBRC, and DLISAS procedures.
- The SYSDUMP DD statement must specify DISP=MOD, because it is possible for multiple tasks to generate dumps during the processing of an error.
- The SYSDUMP data set must be refreshed (for example, scratched and reallocated) before it can be reused. If this is not done, new dumps are appended to the end of the data set and may not be accessible to the Offline Dump Formatting utility.
- Do not use SYSDUMP in place of SYSABEND or SYSUDUMP.

## Spinoff dumps

If spinoff dumps are used, be aware of these additional considerations:

- If a spinoff dump SYSOUT class is specified (SOD EXEC parameter in the IMS control region), a spinoff dump is generated for nonterminating errors.
- Spinoff dumps allow the dump data set to be released to JES for immediate printing. (This can be useful when external subsystems are supported.)
- Spinoff dumps are only generated for those tasks that do not terminate IMS.
- If a SYSABEND or SYSUDUMP DD statement is not provided, the first dump is not printed. For subsequent dumps, the dump data set is dynamically allocated using the spinoff dump class.
- The spinoff dump class (SOD execute parameter) should be the same as the SYSABEND or SYSUDUMP SYSOUT class.

If the classes are different, the first dump goes to the class specified on the SYSABEND or SYSUDUMP DD statement. The dump data set is then dynamically deallocated to free the dump for printing and then dynamically reallocated using the spinoff dump class. Therefore, all subsequent dumps go to the spinoff dump class.

- The only valid SYSABEND or SYSUDUMP DD statement parameter used for spinoff dump is the SYSOUT class. Other parameters are ignored.
- Spinoff dumps use the default output limit established during JES definition. Incomplete spinoff dumps can result if the limit specified is too low.

## z/OS dump options

To create IMS dumps that are useful in diagnosing problems, specify the proper dump options for each type of z/OS dump used for IMS.

Use the z/OS operator command DISPLAY DUMP, OPTIONS to determine the dump options currently in effect on your system.

If the current dump options do not include the options listed in this section, the defaults that are obtained from SYS1.PARMLIB (members IEAABD00, IEADMP00, and IEADMR00) must be altered. Use the z/OS operator command CHNGDUMP to change dump options.

| Type of dump | z/OS dump options                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDUMP        | SDUMP=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ)                                                                                                                 |
| SYSABEND     | <ul style="list-style-type: none"><li>• SYSABEND,SDATA=(CB,DM,ENQ,ERR,IO,LSQA,SUM,TRT)</li><li>• SYSABEND,PDATA=(JPA,LPA,PSW,REGS,SA,SPLS)</li></ul> |
| SYSUDUMP     | <ul style="list-style-type: none"><li>• SYSUDUMP,SDATA=(CB,ERR,SUM)</li><li>• SYSUDUMP,PDATA=(JPA,LPA,PSW,REGS,SA,SPLS)</li></ul>                    |

Table 260. z/OS dump options (continued)

| Type of dump                  | z/OS dump options                       |
|-------------------------------|-----------------------------------------|
| SYSMDUMP (online system only) | SYSMDUMP=(CSA,LSQA,RGN,SQA,SUM,SWA,TRT) |
| SYSMDUMP (batch system only)  | SYSMDUMP=(LSQA,RGN,SQA,SUM,SWA,TRT)     |

### IMS online system dump options

In an online IMS environment, the following dumps are possible:

- SDUMP to a SYS1.DUMPxx data set. SDUMP can then be formatted using the Offline Dump Formatter utility.

This dump can be generated both for errors that cause IMS to terminate (*terminating errors*) and for errors that do not cause IMS to terminate (*nonterminating errors*).

- SYSABEND or SYSUDUMP with IMS or z/OS formatting performed online.

This dump is generated for terminating errors only if SDUMP fails or was not requested.

- SYSMDUMP to a data set. SYSMDUMP can then be formatted using the Offline Dump Formatting utility.

This dump is generated for terminating errors only if SDUMP fails or was not requested.

- Spinoff dump to SYSABEND or SYSUDUMP with z/OS formatting performed.

This dump is generated for nonterminating errors and can be generated in addition to SDUMP.

### Online system dependent region dump options

Except for SDUMPs, the dumping options for the dependent regions are controlled by the following:

- The spinoff dump SYSOUT class (SOD EXEC parameter in the DFSMPR and IMSFP procedures)
- The presence or absence of a SYSABEND or SYSUDUMP DD statement in the dependent region JCL. These DD statements are mutually exclusive; provide only one.

Do not use SYSMDUMP in IMS dependent regions.

### MPP, IFP, and BMP dependent regions

In the online IMS environment, the following dumps are useful for MPP, IFP, and BMP dependent regions:

- SYSABEND or SYSUDUMP (with z/OS formatting performed online).
- Spinoff dump to SYSABEND or SYSUDUMP (with z/OS formatting). This dump is available only for MPP and IFP dependent regions.
- SDUMP to a SYS1.DUMPxx data set. (SDUMP can then be formatted using the Offline Dump Formatter utility.) An SDUMP is produced in the dependent region for certain IMS system errors involving DL/I or Fast Path. In this instance, the SDUMP is controlled by the FMTO specification for the control region.

### Spinoff dumps in dependent regions

If spinoff dumps are used, some additional considerations are necessary:

- Spinoff dumps allow the dump data set to be released to JES for immediate printing. (This can be useful for "never-ending" MPP or IFP regions.)
- If a SYSABEND or SYSUDUMP DD statement is not provided, the first dump is not be printed. For subsequent dumps the dump data set is dynamically allocated using the spinoff dump class.
- The spinoff dump class (SOD EXEC parameter) should be the same as the SYSABEND or SYSUDUMP SYSOUT class.

If the classes are different, the first dump goes to the class specified on the SYSABEND or SYSUDUMP DD statement. The dump data set is then dynamically deallocated to free the dump for printing and then dynamically reallocated using the spinoff dump class. Therefore, all subsequent dumps go to the spinoff dump class.

- The only valid SYSABEND or SYSUDUMP DD statement parameter used for a spinoff dump is the SYSOUT class. Other parameters are ignored after the first dump.
- Spinoff dumps use the default output limit established during JES definition. Incomplete spinoff dumps can result if the limit specified is too low.
- If the COBOL DEBUG option is used, dumps cannot be generated.

### Batch system dumps

In the batch IMS environment, the following dumps are possible:

- SYSMDUMP to a data set. (SYSMDUMP can then be formatted using the Offline Dump Formatting utility.) This dump is only generated for terminating errors.
- SYSABEND or SYSUDUMP (with IMS or z/OS formatting performed online). This dump is only generated for terminating errors.

### FMTO options for batch dumps

The FMTO options for batch dumps, and their effect on the dumps produced, are different from the FMTO options described in [“FMTO options”](#) on page 598. The FMTO options for batch dumps are summarized in [Table 259](#) on page 599.

When using Batch FMTO options, remember the following:

- If a SYSMDUMP DD statement is present, a machine readable dump is generated for terminating errors.
- If IMS online formatting is requested and a SYSABEND or SYSUDUMP DD statement is present, an IMS online formatted dump is generated for terminating errors.
- If IMS online formatting is not requested and a SYSABEND or SYSUDUMP DD statement is present, a z/OS online formatted dump is generated for terminating errors.
- The default is FMTO=D.
- SYSABEND, SYSUDUMP, and SYSMDUMP are mutually exclusive.
- z/OS formatting always accompanies IMS online formatting.

In the following table, the following codes are used:

#### Option

##### Effect on dump produced

#### TE

Error would terminate IMS.

#### NT

Error would not terminate IMS.

#### FDDL

Formatted dump delete list processing.

#### Y

Yes

#### N

No

#### —

Not applicable, or not attempted.



Table 261. Batch FMTO options

| FMTO Value | IMS Online Formatting SYSABEND<br>SYSUDUMP |    |      | z/OS Online<br>Formatting SYSABEND<br>SYSUDUMP |    | IMS Offline Formatting<br>SYSMDUMP |    |
|------------|--------------------------------------------|----|------|------------------------------------------------|----|------------------------------------|----|
|            | TE                                         | NT | FDDL | TE                                             | NT | TE                                 | NT |
| D          | Y                                          | —  | Y    | Y                                              | —  | Y                                  | —  |
| X          | Y                                          | —  | Y    | Y                                              | —  | Y                                  | —  |
| M          | N                                          | —  | N    | Y                                              | —  | Y                                  | —  |
| R          | N                                          | —  | N    | Y                                              | —  | Y                                  | —  |
| T          | Y                                          | —  | Y    | Y                                              | —  | Y                                  | —  |
| P          | Y                                          | —  | N    | Y                                              | —  | Y                                  | —  |
| F          | Y                                          | —  | N    | Y                                              | —  | Y                                  | —  |
| N          | N                                          | —  | N    | Y                                              | —  | Y                                  | —  |
| Z          | N                                          | —  | N    | Y                                              | —  | Y                                  | —  |

If SYSMDUMP is used, be aware of these additional considerations:

- The SYSMDUMP DD statement should specify DISP=MOD.
- If DISP=MOD is used, then the SYSMDUMP data set must be refreshed (for example, scratched and reallocated) before it can be reused. If this is not done, new dumps are appended to the end of the data set and might not be accessible to the Offline Dump Formatting utility.

#### Related concepts

[“Dump contents returned for different FMTIMS options” on page 567](#)

You can specify different FMTIMS options to add different types of information to a formatted IMS system dump.

#### Related reference

[“Sequential buffering service aids” on page 220](#)

When you receive a message or abend that indicates a problem with sequential buffering (SB), several diagnostic tools are available. Some of these tools are useful for diagnosing other IMS database-related problems.

## IMS Dump Formatter menus

You can use the options on the IMS Dump Formatting Menu to browse the dump data set, and perform high-level or low-level IMS formatting.

To use the menus:

1. Go to the IPCS Component Analysis panel.
2. Select DFSAAMPR. The IMS Dump Formatting Primary Menu panel appears.

```

DFSAMPR ----- IMS DUMP FORMATTING PRIMARY MENU -----
OPTION ==>

 0 INIT          - IMS formatting initialization and content summary
 1 BROWSE       - Browse dump data set (IPCS norm)          *****
 2 HI-LEVEL    - IMS Component level formatting           *USERID - SKONO
 3 LOW-LEVEL   - IMS ITASK level formatting              *DATE   - 00/01/06
 4 ANALYSIS    - IMS dump analysis                      *JULIAN - 00.006
 5 USER        - IMS user formatting routines            *TIME   - 15:00
 6 OTHER COMP  - Other IMS components (BPE, CQS...)      *PREFIX - SKONO
 7 OTHER PROD  - Other IMS-related products             *TERMINAL- 3278
 E EDA         - IMS Enhanced Dump Analysis            *PF KEYS - 24
 T TUTORIAL    - IMS dump formatting tutorial
 X EXIT        - Exit IMS dump formatting

Enter END command to terminate IMS component formatting

```

Figure 80. IMS Dump Formatting Primary Menu panel

- If this is the first time you are reading the dump, select 0 (Initialization). The IMS Dump Content Status panel opens.

```

DFSAAEIO ----- IMS DUMP CONTENT STATUS -----
COMMAND ==>

Enter the IMS CTL/BATCH or DL/I jobname to cause the IMS symbols to
be set for this dump. Request subsystem list for possible IMS names.

IMS SUBSYSTEM LIST DESIRED? (Y or N)====> N

      JOBNAME      ID      ASID      DUMPED?
-----
CTL
DL/I
DBRC
IRLM

ABEND CODE = SYS      USER
MODULE      =

IMS SDWA ADDRESS - 00672918  IMS RELEASE - 1010
IMS SCD ADDRESS  - 00C449E8  IRLM LEVEL  - N/A
ABENDED ASID    - 0027

```

Figure 81. IMS dump formatting initialization/content panel - inactive

- Type the IMS job name in the row marked CTL, or the DL/I job name in the row marked DL/I, and press Enter. If you do not know the job name, type Y next to the IMS SUBSYSTEM LIST DESIRED prompt to scan for dumped IMS address spaces. When valid information has been supplied, several fields are filled in the panel, as shown in the following figure. Press PF3 to return to the primary menu.

```

Enter the IMS CTL/BATCH or DL/I jobname to cause the IMS symbols to
be set for this dump. Request subsystem list for possible IMS names.

N <==== IMS SUBSYSTEM LIST DESIRED? (Y or N)
N <==== FORMATTER REFRESH? (Y or N)

      JOBNAME      ID      ASID      DUMPED?
-----
CTL  IMS1          IMS1      0041      YES
DL/I HPCICSAK      003F      YES
DBRC DBRCSAK      0029      YES
IRLM IRLME2N      IRLM     003D      YES
TMS

ABEND CODE = SYS 0C4      USER 0
MODULE      = UNKNOWN

IMS SDWA ADDRESS - 006728D0  IMS RELEASE - 1110
IMS SCD ADDRESS  - 00C549B8  IRLM LEVEL  - IRLM22
ABENDED ASID    - 0041

```

Figure 82. IMS dump formatting initialization/content panel - active

- IMS formatting is invoked from the high-level, low-level, and analysis option menus. Each menu contains a list of selectable entries. Type S or M next to an entry to request formatting, and press Enter

to process your selections. Examples of the high-level and low-level options menus are shown in the following panels.

### IMS High-Level Dump Formatting panel

```

----- IMS HIGH LEVEL DUMP FORMATTING OPTIONS ----- ROW 1 OF 23
Command ==>   Scroll ==> PAGE

N <====SPOOL OUTPUT? (Y or N)          N <====REFRESH FORMATTER? (Y or N)
      S = select      M = select,min      select choices and hit enter
  to process or UP/DOWN to scroll

Additional IMS format requests==>

Cmd  Option          Description
-----
-    AUTO            Internally determined options (by failing ITASK type)
-    ALL             All high level IMS dump formatting options
-    SUMMARY        PSW, regs, SAP, failing ITASK blocks at time of abend
-    SCD            SCD, SLX, FP ESCD, scheduler sequence queues
-    SAVEAREA       SAP, savearea, ECB prefix, UEHB (sorted by DSPNO)
-    DISPATCH       Dispatcher work areas, Dispatcher and Latch traces
-    SPST           System PSTs and subordinate blocks
-    RESTART        CHKPT ID table, SIDX, LCRE, RPST, RRE, EQEL, IEEQE, FRB
-    LOG            LCD, log buffer prefixes, log buffers (OLDS and MON)
-    DB             DDIRs, PDIRs, intent list, DLI and LOCK traces, DPSTs
-    DEDB           ALDS, DMCB, DMAC, XCRB, SRB, ESRB
-    MSDB           BHDR, Main storage databases
-    DC             CLB, LLB, VTCB, CTB, CNT, CTT, SMB, SPQB, LGND, USRD
-    EMH            RCTE, BALG, EMHB
-    QM             QPOOL, QSCD, QMGR hash table, QBFPRF, Queue buffers
-    UTIL           Partial reorg blocks
-    SUBS           External subsystem blocks and trace
-    CBT            Control block table
-    SDE            Storage Descriptor Element Blocks and Storage
-    SB             Sequential buffering control block formatting
-    DBRC           DBRC control blocks and trace
-    IRLM           IRLM control block formatting
-    LUM            LUM trace and control blocks
-    LR             Log router trace and control blocks
-    TMS            Transport manager control blocks
-    TMSC           Transport manager component dump formatting
-    AOI            Automated Operator Interface (Directed Message Manager)
-    OTMA           Open TM Access
-    DBRM           Database Recovery Manager
-    SMBS           All SMBS
***** Bottom of data *****

```

The IMS high-level formatter request panel facilitates the selection of IMS formatting areas. The MIN qualifier and spooling and terminal outputs can be selected as well.

## IMS Low-Level Formatting selection panel

```
DFSAALL0 ----- IMS LOW LEVEL DUMP FORMATTING OPTIONS ----- ROW 1 OF 17  
COMMAND ==> Scroll ==> PAGE
```

```
N <===== SPOOL OUTPUT? (Y or N)   N <===== REFRESH FORMATTER? (Y or N)  
      S or M at left plus required ARGument value to select option.  
      (Items marked *P* will prompt if ARG blank). UP/DOWN to scroll
```

```
Additional IMS formatter requests==>
```

| Cmd | Option | Type    | ARG | Argument description                       |
|-----|--------|---------|-----|--------------------------------------------|
| -   | CLB    | ADDRESS |     | CLB/LLB address (hexadecimal)              |
| -   | CLB    | NODE    |     | VTAM node name                             |
| -   | CLB    | LTERM   |     | IMS logical terminal name (CNT)            |
| -   | CLB    | CID     |     | VTAM communication ID (hexadecimal)        |
| -   | LLB    | LINK    |     | MSC link number (decimal)                  |
| -   | DPST   | ADDRESS |     | Dependent region PST address (hexadecimal) |
| -   | DPST   | NUMBER  |     | Dependent region PST number (hexadecimal)  |
| -   | DPST   | NAME    |     | Dependent region PST jobname               |
| -   | SYSPST | ADDRESS |     | System PST address                         |
| -   | SYSPST | NAME    | *P* | System PST name                            |
| -   | TRACE  | NAME    | *P* | Trace table ID (2 characters)              |
| -   | SAP    | ADDRESS |     | Savearea block address (hexadecimal)       |
| -   | SAP    | ECBADR  |     | SAP's ECB address (hexadecimal)            |
| -   | POOL   | NAME    | *P* | IMS storage pool name                      |
| -   | CBTE   | NAME    |     | Control Block Table name                   |
| -   | LUB    | NAME    |     | LU name                                    |
| -   | DTT    | ADDRESS |     | DTT address                                |
| -   | SMB    | NAME    |     | SMB by transaction name                    |
| -   | SMB    | ADDRESS |     | SMB address                                |

\*\*\*\*\* Bottom of data \*\*\*\*\*

## IMS Dump Analysis selection panel

```
DFSAALA0 ----- IMS DUMP ANALYSIS -----  
COMMAND ==>
```

```
N <=====SPOOL OUTPUT? (Y or N)   N <=====REFRESH FORMATTER? (Y or N)
```

```
Put an S left of desired option to select. Additional FMTIMS  
strings may be entered after "ADDITIONAL REQUESTS". Press Enter to  
process.
```

```
Additional formatting requests ==>
```

| CMD | analysis option | output description             |
|-----|-----------------|--------------------------------|
| -   | SAPS            | savearea set overview analysis |

## IMS components formatting panels

The IMS components Common Queue Server (CQS), Database Recovery Facility (DBRC), IMS Connect, Open Database Manager (ODBM), Operations Manager (OM), Repository Server (REPO), Resource Manager (RM), and Structured Call Interface (SCI), run under the Base Primitive Environment (BPE) system services, rather than the IMS system services. These components use the BPE formatter, and their format options are selected separately from the IMS Dump Formatter.

BPE direct external trace lets any component that is running under the BPE system services write ad hoc data of variable length directly to the BPE data set. To use BPE direct external trace, you must enable it when you create the trace table definition. See "Setting up IMS for diagnostics" in *IMS Version 14 System Definition*.

**To access the BPE External Trace Formatting panels:**

1. Select Other IMS components formatting from the IMS Dump Formatting Primary menu panel, type 6 and press **Enter**.  
The IMS Components panel appears.
2. Select the component that you are formatting or select B for the BPE formatting panel, and press **Enter**.
3. Type 4 to access the BPE external trace formatting panel, and press **Enter**.  
The BPE External Trace Formatting panel opens. From this panel, you can select the specific component formatting to be done (for example, BPE or CQS). Dump initialization for these components is done through the BPE status and initialization panel under option 0 after step 2.

```

-- IMS BPE EXTERNAL TRACE FORMATTING MENU --
OPTION ==>

Input BPE trace DSN _____
Specify any BPE component. . . . . _____ (component type or ALL)
Specify any BPE trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Asynchronous work element (AWE) . . . . . _ (Y/N)
Control block storage/services (CBS) . . . . _ (Y/N)
Commands trace (CMD) . . . . . _ (Y/N)
Dispatcher trace (DISP) . . . . . _ (Y/N)
Error trace table (ERR) . . . . . _ (Y/N)
Hash table services (HASH) . . . . . _ (Y/N)
Latch management and serialization (LATC) . . _ (Y/N)
System service calls (SSRV) . . . . . _ (Y/N)
Storage service requests (STG) . . . . . _ (Y/N)
Activity related to exit routines (USRX) . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time . . . _____ (Example 2002190 133500)
UTC or Local . . . _ (U/L) Convert trace STCK . . . _ (Y/N)

```

Figure 83. BPE External Trace Formatting panel

```

-- CQS BPE EXTERNAL TRACE FORMATTING MENU --

Input BPE trace DSN _____
Specify any CQS trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Common Queue Server Trace (CQS) . . . . . _ (Y/N)
CQS Error Trace (ERR) . . . . . _ (Y/N)
CQS Interface Trace (INTF) . . . . . _ (Y/N)
CQS Overflow Trace (OFLW) . . . . . _ (Y/N)
CQS Structure Event Trace (SEVT) . . . . . _ (Y/N)
CQS Structure Trace (STR) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time . . . _____ (Example 2002190 133500)
UTC or Local . . . _ (U/L) Convert trace STCK . . . _ (Y/N)

```

Figure 84. CQS BPE External Trace Formatting panel

```

----- DBRC BPE EXTERNAL TRACE FORMATTING MENU -----
OPTION ==> -----
Input BPE trace DSN _____
Specify any DBRC trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Error Trace (ERR) . . . . . _ (Y/N)
DBRC Request Trace (RQST) . . . . . _ (Y/N)
DBRC Module Flow Trace (MODF) . . . . . _ (Y/N)
DBRC Group Service Trace (GRPS) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time. . . _____ (Example 2002190 133500)
UTC or Local. . . . _ (U/L) Convert trace STCK. . . Y (Y/N)

```

Figure 85. DBRC BPE External Trace Formatting panel

```

----- ODBM BPE EXTERNAL TRACE FORMATTING MENU -----
OPTION ==> -----
Input BPE trace DSN _____
Specify any ODBM trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Open Database Manager (ODBM) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time. . . _____ (Example 2002190 133500)
UTC or Local. . . . _ (U/L) Convert trace STCK. . . Y (Y/N)

```

Figure 86. ODBM BPE External Trace Formatting panel

```

-- OM BPE EXTERNAL TRACE FORMATTING MENU --
OPTION ==>
Input BPE trace DSN _____
Specify any OM trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Common Service Layer (CSL) . . . . . _ (Y/N)
Error Trace (ERR) . . . . . _ (Y/N)
Trace (OM) . . . . . _ (Y/N)
IMSplex Trace for OM (PLEX) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time. . . _____ (Example 2002190 133500)
UTC or Local. . . . _ (U/L) Convert trace STCK. . . _ (Y/N)

```

Figure 87. OM BPE External Trace Formatting panel

```

-- RM BPE EXTERNAL TRACE FORMATTING MENU --
OPTION ==>
Input BPE trace DSN _____
Specify any RM trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Common Service Layer (CSL) . . . . . _ (Y/N)
Error Trace (ERR) . . . . . _ (Y/N)
Trace (RM) . . . . . _ (Y/N)
IMSplex Trace for RM (PLEX) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time. . . _____ (Example 2002190 133500)
UTC or Local. . . . _ (U/L) Convert trace STCK. . . _ (Y/N)

```

Figure 88. RM BPE External Trace Formatting panel

```

-- SCI BPE EXTERNAL TRACE FORMATTING MENU --
OPTION ==>

Input BPE trace DSN _____
Specify any SCI trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Common Service Layer (CSL) . . . . . _ (Y/N)
Error Parameter List (ERPL) . . . . . _ (Y/N)
Error (ERR) . . . . . _ (Y/N)
Interface (INTF) . . . . . _ (Y/N)
Interface Parameter (INTP) . . . . . _ (Y/N)
Structured Call Interface (SCI) . . . . . _ (Y/N)
IMSpIex Trace for SCI (PLEX) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time . . . _____ (Example 2002190 133500)
UTC or Local . . . . _ (U/L) Convert trace STCK. . . _ (Y/N)

```

Figure 89. SCI BPE External Trace Formatting panel

```

-- IMS CONNECT BPE EXTERNAL TRACE FORMATTING MENU --
OPTION ==>

Input BPE trace DSN _____
Specify any IMS Connect trace type . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Common Trace (CMDT) . . . . . _ (Y/N)
Interface (ENVT) . . . . . _ (Y/N)
IMS Connect to OTMA driver (HWSI) . . . . . _ (Y/N)
IMS Connect to local option driver (HWSN) . . . . . _ (Y/N)
IMSpIex driver and IMS Connect events (HWSO) . . . . . _ (Y/N)
IMS Connect to TCP/IP driver (HWSW) . . . . . _ (Y/N)
SCI calls activity (OMDR) . . . . . _ (Y/N)
OTMA Communication driver (OTMA) . . . . . _ (Y/N)
Local option driver (PCDR) . . . . . _ (Y/N)
TCP/IP communication driver (TCPI) . . . . . _ (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2002190 133500)
Stop Date/Time . . . _____ (Example 2002190 133500)
UTC or Local . . . . _ (U/L) Convert trace STCK. . . _ (Y/N)

```

Figure 90. IMS Connect BPE External Trace Formatting panel

```

----- REPOSITORY SERVER BPE EXTERNAL TRACE FORMATTING MENU -----
OPTION ==>

Input BPE trace DSN _____
Specify any RS trace type . . . . . _____ (trace type or ALL)

Select the BPE external trace record types to format or type ALL above:
Repository Server Diag (DIAG) . . . . . (Y/N)

Optional parameters:
Start Date/Time . . . _____ (Example 2010195 164224)
Stop Date/Time . . . _____ (Example 2010195 164242)
UTC or Local . . . . U (U/L) Convert trace STCK. . . N (Y/N)

```

Figure 91. REPO BPE External Trace Formatting panel

**Related concepts**

[Base Primitive Environment overview \(System Administration\)](#)

## Using the other IMS-related products formatting panels

IMS provides a selection for calling the dump formatters for products that are separate from IMS, but are still related to IMS.

Select Other IMS-related products formatting from the IMS dump formatting primary menu panel, type 7, and press **Enter**

You are then presented with a list of all possible products. However, you can only use the formatters of those products that are installed on your system. Each product's formatter will provide a dump initialization panel; you should not use the panel from option 0 on the primary menu.

```
DFSAAMPR ----- IMS DUMP FORMATTING PRIMARY MENU -----
OPTION  ===>

  0  INIT          - IMS formatting initialization and content summary
  1  BROWSE       - Browse Dump data set (IPCS norm)          *****
  2  HI-LEVEL    - IMS Component level formatting             *USERID  - IMSDUMP
  3  LOW-LEVEL   - IMS ITASK level formatting                 *DATE    - 00/08/23
  4  ANALYSIS    - IMS dump analysis                         *JULIAN  - 00.236
  5  USER       - IMS user formatting routines              *TIME    - 16:06
  6  OTHER COMP - Other IMS components (BPE, CQS...)         *PREFIX  - IMSDUMP
  7  OTHER PROD  - Other IMS-related products                *TERMINAL- 3278
  E  EDA         - IMS Enhanced Dump Analysis               *PF KEYS -
  T  TUTORIAL   - IMS dump formatting tutorial               *****
  X  EXIT       - Exit IMS dump formatting

Enter END or RETURN command to terminate IMS component formatting.

Use PFKeys to scroll up and down if needed.
```

Figure 92. IMS Dump Formatting Primary Menu panel

## IMS IPCS symbols

IMS offline dump formatting creates IPCS symbols for selected key IMS control blocks. IMS creates and lists the IPCS symbols when the job name of an address space using BPE is supplied in the BPE initialization panel (for example, a CQS, OM, RM, or SCI address space).

The Interactive Formatter helps create these symbols and then uses them to make Offline Dump Formatter requests easier by providing known starting points, including starting points for CLISTs. The dump formatter also sets symbols for the registers (R0-R15) and PSW (DFSPSW) at abend for abend dumps. This allows you to quickly locate areas in storage pointed to by the registers and PSW when you are in IPCS browse mode.

## Using IMS enhanced dump analysis

You use the IMS Enhanced Dump formatting menu to browse and select formatting options for database, Fast Path, Transaction Manager and System dumps. There is also a tutorial available about the formatter and how to use the filtering tool.

1. Select option E from the IMS dump formatting primary menu.

The IMS Enhanced Dump Formatting Menu displays, as shown in the following figure.

```
----- IMS ENHANCED DUMP FORMATTING MENU
OPTION  ===>

  1  BROWSE       - Browse dump dataset (IPCS norm)
  2  DB           - Full Function Data Base
  3  FP           - Fast Path Data Base
  4  TM           - Transaction Management and DC
  5  SYS          - Systems
  6  DBRC         - Database Recovery Control
  T  TUTORIAL    - IMS Dump Formatter Tutorial
  X  EXIT        - Exit EDA dump formatting menu

Enter END or RETURN command to terminate IMS component
```

Figure 93. IMS Enhanced Dump Formatting Menu



In this panel, the control blocks are organized by function for ease of use. For example, EPST (the extended partition specification table) is located under option 3 for Fast Path.

2. To review tutorial information about the formatter and about how to use the filtering tool, type T and press **Enter**.
3. To use a filtering tool to identify filtering criteria, type on of the options 2, 3, 4, or 5 and press **Enter**.

An example of a filtering panel is shown in the following figure.

```
----- Generic Filtering Panel
-----
Explanation of the fields:
  Offset (required) - Offset of the field in the block.
                    (hex)
  Length (default = 1) - Length of field in the control
                    block. (decimal)
  Cond (default = EQ) - Type of compare to be done. (EQ,NE,
                    GT,GE,LT,LE)
  Bit (default = N) - Should comparison be a bit mask?
                    (Y or N)
  Type (default = X) - Is the value type decimal, hex, or
                    char (D,X,A)?
  Value (required) - Value of the field to be compared
                    at given offset.
  Qual - Qualify filter to search in
                    sub-blocks.
  AND/OR - How to combine multiple conditions.
                    If blank, only the first condition
                    will be executed.
                    (up to four conditions
allowed).
```

*Figure 94. Sample filtering panel*

4. You can overwrite the generic filtering panel default values. For example, you can select criteria that presents two separate conditions. By selecting AND you indicate that both conditions must be true
  - a) You want all the blocks starting at OFFSET 1C that have a value of X'08.'
  - b) You want all the blocks starting at OFFSET A4 that have a non-zero value.

These values are shown in the following figure.

```
<===== AND/OR (A/0) QUAL =====>
```

*Figure 95. Sample filtering criteria*

## Formatting log records for use with log analysis tools

You can use the IMS Dump Formatter to recreate the final part of an IMS log from the information that is available in an IMS dump.

The log records in the log buffers of a dump are copied to a VB file that can be analyzed by the File Select and Formatting Print utility (DFSERA10) or other log analysis tools. Log records can then be put in increasing log sequence number (LSN) order and be manipulated with the DFSERA10 utility.

1. Select option E (EDA - IMS Enhanced Dump Analysis) from the IMS Dump Formatting primary menu.

```

----- IMS DUMP FORMATTING PRIMARY MENU -----
.
.  OPTION ==> E
.
.  0  INIT       - IMS formatting initialization and content summary
.  1  BROWSE     - Browse Dump dataset          *****
.  2  HI-LEVEL   - IMS Component level formatting  *USERID  - BETHRM
.  3  LOW-LEVEL  - IMS ITASK level formatting     *DATE    - 08/02/07
.  4  ANALYSIS   - IMS dump analysis             *JULIAN  - 08.038
.  5  USER       - IMS user formatting routines  *TIME    - 16:38
.  6  OTHER COMP - Other IMS components (BPE, CQS...) *PREFIX  - BETHRM
.  7  OTHER PROD - Other IMS-related products    *TERMINAL- 3278
.  E  EDA        - IMS Enhanced Dump Analysis   *PF KEYS -
.  T  TUTORIAL   - IMS dump formatting tutorial   *****
.  X  EXIT       - Exit IMS dump formatting
.
.  Enter END or RETURN command to terminate IMS component formatting.
.  Use PFKeys to scroll up and down if needed.
.
.  * This product contains "Restricted Materials of IBM". 5655-C56 (C) *
.  * Copyright IBM Corp. 1991,2000 Licensed Materials - Property of IBM. *
.  * All rights reserved. U.S. government users restricted rights - use, *
.  * duplication, or disclosure restricted by GSA ADP schedule contract *
.  * with IBM Corp. Refer to copyright instructions form number G120-2083. *
.
.
.
.
.
.
.

```

2. Select option 5 (SYS - Systems) from the IMS Enhanced Dump Formatting menu.

```

----- IMS ENHANCED DUMP FORMATTING MENU -----
.
.  OPTION ==> 5
.
.  1  BROWSE     - Browse dump dataset (IPCS norm) *****
.  2  DB         - Full Function Data Base      *USERID  - BETHRM
.  3  FP         - Fast Path Data Base         *DATE    - 08/03/05
.  4  TM         - Transaction Management and DC *JULIAN  - 08.065
.  5  SYS        - Systems                     *TIME    - 17:05
.  6  DBRC       - Database Recovery Control    *PREFIX  - BETHRM
.  T  TUTORIAL   - IMS Dump Formatter Tutorial *TERMINAL- 3278
.  X  EXIT       - Exit EDA dump formatting menu *PF KEYS -
.   *****
.
.  Enter END or RETURN command to terminate IMS component formatting.
.
.

```

3. Select WRITE from the Systems Formatting options menu.

```

----- SYSTEMS FORMATTING OPTIONS ----- Row 1 to 14 of 14
.
.  S = SELECT                Select choice and hit enter to process.
.                          Use UP/DOWN to scroll.
.
.
.
.  Cmd Type       Description
.  v-----vvvvvvvv-----
.  -   BCB         BCB statistics summary
.  -   BPECSCD     BPE LFS CSCD in the IMS control region
.  -   BPEHASH     BPE LFS hash tables in the IMS control region
.  -   CDE         CDE/SDE storage List
.  -   CDECOMM     CDE/SDE storage list (common only)
.  -   CSLA       CSL anchor block formatting
.  -   DFA       Definition Anchor Block and sub-blocks
.  -   GRMB      Global RESMGR Block, trace table, and SSCTs
.  -   OCMD      OM command instance block formatting
.  -   PDIR      PSB Directory Formatting
.  -   PST       PST formatting menu
.  -   SMB       SMB formatting menu
.  -   TRC       Trace Control Blocks
.  S   WRITE     Write data to output dataset
.  ***** Bottom of data *****
.
.
.  COMMAND ==>                               Scroll ==> PAGE

```

The WRITE option writes the contents of the log records that are within the buffers of the dump to a data set.

## Formatting a dump for analysis

You can use the IMS Dump Formatter to format a dump for analysis.

To format a dump for analysis:

1. Start IPCS with the IMS Dump Formatter.
2. Select the dump you want to browse.
3. From the IPCS Primary Option Menu, select Option 2.6, ANALYSIS.COMPONENT.
4. From the Component Analysis Panel, select DFSAAMPR.
5. From the IMS Dump Formatting Primary Option Menu, select Option 0, INIT.
6. From the IMS Dump Contents Status Panel, enter the job name of either the IMS control/batch region or the IMS DLISAS region.
7. Press the Enter key and then PF3 to return to the IMS Dump Formatting Primary Option Menu.
8. Select an option from the Primary Option Menu. HILEVEL is a good starting point because it provides a broad diagnostic overview of the problem.

## Formatting IMS dumps online

---

One of the tools available for problem diagnosis is the IMS formatted dump, which formats the control blocks and data areas in an IMS region.

### Abnormal Termination

When an abnormal termination occurs and dumping is to be performed, CSECT DFSABND0 gets control from the SCP and gives control to IMS routines to do the dumping. To assist you in locating areas that are dumped, eye catchers are supplied in the formatted dump. See [“Eye catchers” on page 592](#) for eye catcher examples.

**Exception:** Address spaces using BPE (for example, CQS, OM, RM, and SCI) do not provide any online dump formatting output.

## Formatted dump for the CTL address space

You can use DSECT mapping macros (when applicable) to analyze control address space areas when they are dumped. The various CTL areas are listed and described.

### CTL address space areas

The following is a list of the control address space areas that are dumped (in the order in which they are dumped) and, where applicable, the DSECT mapping macros that are most useful in analyzing them. For a list of the areas dumped when LSO=S, see [“Formatted dump for the DL/I address space” on page 616](#). Descriptive information has been added for some control blocks where it would be useful.

#### Diagnostic Area

Contains the PSW, system and user completion codes, save area ID of the module that was executing, and registers in use when abnormal termination occurred.

#### Instruction Area

Contains the area of storage from 128 bytes before to 128 bytes after the address of the failing instruction in the PSW.

#### System Diagnostic Work Area

The mapping DSECT is IHASDWA.

#### U0113 Area

Present when an abend caused the dump.

**Referenced Sap**

The mapping DSECT is ISAP.

**System Contents Directory**

The mapping DSECT is ISCD.

**SCD Extension**

The mapping DSECT is DBFESCD.

**SCD Latch Extension**

The mapping DSECT is ISCD.

**Scheduler Sequence Queues**

Controls the status of each region. The mapping DSECT is ISCD.

**FP ESCD**

The mapping DSECT is DBFESCD.

**Control Block Table**

Contains entries of control blocks that macro DFSCBTS uses for tracking. The mapping DSECT is DFSCBTS.

**Save Area Prefix**

All SAPs are SNAPed except those owned by the DL/I address space. Each SAP is followed by its save area set. At the end of this section, all of the SAP IPAGES are dumped.

**IMS Task Dispatch Work Area**

The mapping DSECT is IDSPWRK.

**DBRC Task Dispatch Work Area**

If present in the system, it is mapped.

**IMS Control Task Dispatch Work Area**

Contains the same information as the IMS log task dispatch work area.

**Dependent Region Dispatch Work Area**

For every dependent region in IMS, the dispatcher work area is mapped.

**Dispatcher Trace Data**

DSECT IDSPWRK contains the function codes associated with the dispatcher and an explanation of each code.

**Scheduler Trace Data**

Scheduler trace data is mapped by DFSSCHED. The trace entries contain scheduler function codes.

**Latch Trace Data**

The trace entries contain latch and unlatch function codes. The mapping DSECT is IDLIVSAM TRACENT.

**System PSTs**

These are system work areas for any online or batch region. The mapping DSECT is IPST.

**Checkpoint ID Table**

The mapping DSECT is BCPT.

**LCRE**

The mapping DSECT is DFSLCRE.

**SIDX**

The mapping DSECT is DFSSSIE.

**RRE**

The mapping DSECT is DFSRRE.

**Log Control Directory**

Contains information about the IMS log, for example:

- DCB1—the primary log DCB
- DCB2—the secondary log DCB (if dual logs were specified)
- Log ITASK—the status information

The mapping DSECT is LCDSECT.

### **Log Buffers**

Each log buffer contains buffer information and the log control DECB. The mapping DSECT is LCDSECT.

### **Log Trace**

Contains entries which show IMS internal logging activity if the log trace is active. The trace entries are described by the "IDLIVSAM TRACENT" macro.

### **Open Record**

Contains the type 06 log record. The mapping DSECT is ILOGREC.

### **Control Record**

Contains the type 42 log record. The mapping DSECT is ILOGREC.

### **Monitor Log Directory**

Contains the same information as the log control directory and is used for logging data to the IMS Monitor data set.

### **DLOG Trace Data**

Trace table used to show IMS logging activity. The mapping DSECT is ILOGREC (67FA).

### **SUBS Trace Data**

Trace table used by IMS to show IMS activity in attaching or detaching subsystems. The mapping DSECT is ILOGREC (67FA).

### **Global ESET Block**

The mapping DSECT is DFSGESE.

### **PSB Directory**

A SNAP of the PSB directory. The mapping DSECT is PDIR.

### **DMB Directory**

A SNAP of the DMB directory. The mapping DSECT is DDIR.

### **Fast Path Trace**

### **Dependent Region PST**

See Dependent Region PST Formatting [“Formatted dump contents” on page 589](#) for a list of the areas formatted here.

### **OSAM I/O Control Blocks**

The system attempts to dump the IOSB and IOMA blocks.

### **Sequential Buffering Blocks**

Sequential Buffering information is grouped into the following three sections. (See the explanation of the (SB) FMTIMS option [“Solving IMS problems by using the IMS Offline Dump Formatter” on page 561](#) for a complete list of the blocks dumped in each section.)

1. Subsystem Overview for Sequential Buffering
2. PST Overview of Sequential Buffering control blocks
3. Formatted Sequential Buffering control blocks

### **DEDB Formatting**

### **Fast Path EMH Formatting**

### **Fast Path MDSB Formatting**

### **Data Communication Control Blocks**

These areas are noted in a DBCTL environment. For each CLB (line), all the control blocks associated with that line are formatted.

### **CLB**

These areas are noted in a DBCTL environment. The mapping DSECT is ICLI CLBBASE=0.

**CTB**

These areas are noted in a DBCTL environment. The mapping DSECT is ICLI CTBBASE=0.

**Input Buffer**

These areas are noted in a DBCTL environment. A SNAP of the input buffer, if input is active.

**Output Buffer**

These areas are noted in a DBCTL environment. A SNAP of the output buffer, if output is active.

**CCB**

These areas are noted in a DBCTL environment. Present if a conversation is active or held. The mapping DSECT is ICLI CCBBASE=0.

**CIB**

These areas are noted in a DBCTL environment. Present if MFS is in use. The mapping DSECT is ICLI CIBBASE=0.

**Communication Terminal Table**

These areas are noted in a DBCTL environment. Defines terminal characteristics. The mapping DSECT is ICLI CTTBASE=0.

**SPQB Entries**

These areas are noted in a DBCTL environment. Entries on the subpool queue block chain. Unallocated CNTs are also formatted here.

**SMB Table**

These areas are noted in a DBCTL environment. This table defines transaction characteristics in the IMS system. The mapping DSECT is IAPS SMBBASE=0.

**Queue Manager Pool Prefix and Buffers**

These areas are noted in a DBCTL environment. The mapping DSECTs are ICLI POOLBASE=0 and ICLI BFRBASE=0.

**Buffer Prefix List**

These areas are noted in a DBCTL environment. Contains the address of each buffer's prefix, status byte, and first and last pending and current device relative record number (DRRN).

**QPOOL Prefix**

These areas are noted in a DBCTL environment. Contains the main QPOOL prefix formatted. The mapping DSECT is QPOOL.

**IRLM Control Blocks**

The IRLM Subsystem RLMCB block are formatted here if the IMS system is running with IRLM.

**Format/Dump/Delete List**

Contains module names, module IDs, and module dump data that are not in the storage dump listing.

**Formatted dump for the DL/I address space**

One of the tools available for problem diagnosis is the IMS formatted dump, which formats the control blocks and data areas in an IMS region. Dumped areas within the DL/I address space are listed and descriptive information has been added for some control blocks where it would be useful.

**Dumped areas within the DL/I address space****System Contents Directory**

The mapping DSECT is ISCD.

**SCD Latch Extension**

The mapping DSECT is ISCD.

**Scheduler Sequence Queues**

Controls the status of each region. The mapping DSECT is ISCD.

**Save Area Trace**

**Save Area Prefix**

All SAPs belonging to the DL/I address space are SNAPed. A SAP is marked "ACTIVE" if the ITASK associated with it is active. Each SAP is followed by its save area set. At the end of this section, all of the SAP IPAGES are dumped.

**DLS Task Dispatch Work Areas**

The mapping DSECT is IDSPWRK.

**DBRC Task Dispatch Work Area**

If present in the system, it is mapped.

**Dependent Region Dispatch Work Area**

For every dependent region in IMS, the dispatcher work area is mapped.

**Dispatcher Trace Data**

DSECT IDSPWRK contains the function codes associated with the dispatcher and an explanation of each code.

**Latch Trace Data**

The trace entries contain latch and unlatch function codes. The mapping DSECT is IDLIVSAM TRACENT.

**System PSTs**

These are system work areas for any online or batch region. The mapping DSECT is IPST.

**PSB Directory**

A SNAP of the PSB directory. The mapping DSECT is PDIR.

**DMB Directory**

A SNAP of the DMB directory. The mapping DSECT is DDIR.

**Intent List**

This is a SNAP of the intent list.

**Partition Specification Table**

Formats the PST. The mapping DSECT is IPST.

**PDIR**

Formats the PDIR, whose address is in the PST. The mapping DSECT for PDIR is PDIR.

**PSB Prefix**

A SNAP of the PSB prefix, which contains the following:

- Index Maintenance Work Area
- Index I/O Work Area
- Segment Work Area
- I/O Work Area
- SSA Work Area
- User PARMS Area

**Buffer Handler Pool**

The system attempts to format buffer handler blocks in the order in which they are chained on the queue. However, if an error is encountered during the formatting, the entire pool is dumped as is (unchained).

The pool contains the following:

**BFSP**

Formats the buffer pool prefix. The mapping DSECT is BFSP.

**BFUS**

Formats the subpool prefix. The mapping DSECT is BFUS.

**RPLI**

Formats the DL/I RPL block. The mapping DSECT is RPLI.

**DL/I Data**

A dump of the DL/I lock activity and program isolation trace table. The mapping DSECT is IDLIVSAM TRACENT.

**Lock Activity Trace Data**

See DL/I DATA.

**Program Isolation Data**

Includes the QEL, QCB, and REQ areas. The mapping DSECT is XC00.

**OSAM Control Blocks**

The system attempts to follow the main pool, the subpool header, and the buffer prefix, and to dump the buffer. However, if an error is encountered during formatting, the entire buffer pool is SNAPed from the last valid subpool address.

The pool contains the following:

**MAINPOOL**

Formats the main pool header. The mapping DSECT is IBPOOL.

**SUBPOOL**

Formats the subpool header. The mapping DSECT is ISUBPL.

**Buffer Prefix**

Formats the buffer prefix. The mapping DSECT is IBFPRF.

**Buffer**

Physical data not mapped.

**OSAM I/O Control Blocks**

The system attempts to dump the IOSB and IOMA control blocks. The mapping DSECT is QPOOL.

**Sequential Buffering Blocks**

Sequential Buffering information is grouped into the following three sections. (See the explanation of the (SB) FMTIMS option [“Solving IMS problems by using the IMS Offline Dump Formatter”](#) on page 561 for a complete list of the blocks dumped in each section.)

1. Subsystem Overview for Sequential Buffering
2. PST Overview of Sequential Buffering control blocks
3. Formatted Sequential Buffering control blocks

**Fast Path DEDB Formatting****Fast Path EMH Formatting****Fast Path MDSB Formatting****IRLM Control Blocks**

The IRLM Subsystem RLMCB block is formatted here if the IMS system is running with IRLM.

**Format/Dump/Delete List**

Contains module names, module IDs, and module dump data that are not in the storage dump listing.

## SNAP call facility

---

The SNAP call facility (DFSERA20) produces SNAP dumps of DL/I control blocks and identifies calling routines that generate SNAP dumps. Supervisor call (SVC) dumps are generated only for the intended abend codes or status codes, and for unknown calling routines.

The SNAP call facility produces SNAP dumps of DL/I control blocks for the following items:

- External DL/I SNAP calls. The DL/I test program, DFSDDLT0, issues SNAP calls when it detects unequal conditions based on compare statements.
- Exceptional conditions, such as pseudoabends in DL/I modules and message or batch region abends.



- Internal SNAP requests from DL/I modules.
- SNAP specific requests from other IMS modules.

GSAM modules issue SNAP calls for GSAM databases. See [“GSAM control block dump - DFSZD510” on page 223](#) for a description of the GSAM SNAP.

When a SNAP call is performed for a Fast Path region abend, module DFSERA20 bypasses some dumps:

- For a Fast Path database (an MSDB or DEDB), module DFSERA20 bypasses the DMB dump.
- For a DB PCB that refers to a Fast Path database, module DFSERA20 bypasses the DMB, DB PCB, JCB, and SDB dumps.

SNAP output consists of buffer pools and all PSB-related control blocks. Optionally, you can request subpools 0-127 in addition to the buffers and blocks.

SNAP output for exceptional conditions is always directed to the IMS log. In all other cases, IMS sends SNAP output to a data set identified on the PRINTDD DD statement. If this data set is not already open, it is opened and closed for each SNAP request. If you do not supply a PRINTDD statement, IMS sends the SNAP output to the IMS log as X'67FD' log records. When neither a SNAP data set nor the IMS log can be used for SNAPS, all SNAP actions are bypassed.

The File Select and Formatting Print utility (DFSERA10) extracts X'67FD' log records, and the exit routine (DFSERA30) formats them.

Status codes are not set for SNAP calls.

#### **Related reference**

[“Log records” on page 515](#)

To diagnose some problems, you need to examine the content of log records to determine what was going on in the system before the problem occurred. By knowing the layout of the log records, you can set up a DFSERA10 job that will produce the specific log records that you need to examine.

## **/DIAGNOSE command SNAP function**

The **/DIAGNOSE** command SNAP function provides a non-intrusive alternative to creating a console dump. Use of this command can decrease the time that is required to generate problem determination data for IBM Software Support.

The **/DIAGNOSE** command SNAP function takes a current snapshot of system resources at any time without negatively impacting IMS. This system resource information is displayed on the issuing LTERM. Optionally, the resource information can be sent to one of the following data sets:

- Online data set (OLDS)
- SYSOUT data set
- Trace data sets (as type X'6701' log records)

The **/DIAGNOSE** command SNAP function captures information for the following resources:

- A specific IMS control block. For example, the command **/DIAGNOSE SNAP BLOCK(CSCD)** captures storage information for the APPC/OTMA SMQ SCD Extension control block.
- One of the following user-defined resources:
  - User-defined database
  - Communication line
  - Logical link
  - Logical link path
  - Node
  - Program
  - Transaction
  - Logical terminal (LTERM)

- User
- Primary control blocks for a dependent region.
- Any area of storage within the control region address space (by specifying the address of that storage area).
- Prolog information for an IMS load module. The command **/DIAGNOSE SNAP MODULE(modname)** identifies the entry point address and captures prolog information for the specified IMS module. The prolog information contains the current maintenance level for a module on your system, which can help you to determine whether any maintenance is missing.
- A user-defined shared queues structure. The command **/DIAGNOSE SNAP STRUCTURE(structurename)** captures storage information for the DFSSQS control block storage for the specified shared queues structure.

You might also use the **/DIAGNOSE** command SNAP function to:

- Show filtered resource information captured by the SNAP function.
- Specify a limit for the number of lines of formatted SNAP data to display in response to the command.
- Specify the control blocks to be captured by the SNAP function.

The **/DIAGNOSE** command is a standard type-1 command.

#### Related reference

[/DIAGNOSE SNAP command \(Commands\)](#)

## Type-1 trace table interface

For each trace, you can learn about the trace identifier, the events that are traced, and, if the trace is documented in this information, the topic where you can find more information. You use the trace identifier as an eye catcher to locate a trace in a dump.

The common trace table interface consists of the traces shown in the following table.

*Table 262. Trace tables in the common trace interface*

| Trace                          | Table type     | ID  | Traced events                                                                                                                                          | Where described                                                                 |
|--------------------------------|----------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|                                | ALL            | ALL | All IMS table traces                                                                                                                                   |                                                                                 |
| Common Service Layer trace     | CSLT           | CS  | The interaction of IMS with the CSL                                                                                                                    | <a href="#">“Common Service Layer trace” on page 629</a>                        |
| DASD log trace                 | DLOG           | DG  | DASD logging                                                                                                                                           | See "DASD log" in <a href="#">“IMS type-1 trace function codes” on page 624</a> |
| Dispatcher trace (online only) | DISP           | DS  | Dispatcher activities                                                                                                                                  | <a href="#">“Dispatcher trace” on page 634</a>                                  |
| DL/I and lock                  | DLI/I and LOCK | DL  | DL/I calls, DL/I buffer handler, DL/I OPEN/CLOSE, Delete/Replace, HD space management, lock activity using PI or IRLM, OSAM, DFP interface, ABENDU0427 | <a href="#">“DL/I trace” on page 161</a>                                        |
| Enhanced Command Trace         | OCMD           | OC  | Activity related to commands that originate from OM                                                                                                    | Not available                                                                   |

Table 262. Trace tables in the common trace interface (continued)

| Trace                                  | Table type    | ID | Traced events                                 | Where described                                                |
|----------------------------------------|---------------|----|-----------------------------------------------|----------------------------------------------------------------|
| External subsystem trace (online only) | SUBS          | SU | Subsystem activities                          | <a href="#">“External subsystem trace” on page 643</a>         |
| Fast Path Trace                        |               | FT | Fast Path activity                            | <a href="#">“Fast Path trace” on page 684</a>                  |
| Force trace                            | FORCE         | FO | Internal trace for IMS initialization         | Not in use                                                     |
| Intercommunications trace              | IDCO          | IC | VTAM exit activity                            | <a href="#">“Starting the trace” on page 271</a>               |
| Latch trace (online only)              | LATC          | LA | Latch activities                              | <a href="#">“Latch trace” on page 676</a>                      |
| Log router trace                       | LRTT          | LR | Log router activity                           | <a href="#">“Log router trace data” on page 471</a>            |
| LU trace                               | LUMI          | LU | LU 6.2 activity                               | <a href="#">“LU manager trace” on page 329</a>                 |
| Multiple Systems Coupling Trace        | MSCT          | MS | MSC activities. Not yet used.                 | Not applicable                                                 |
| ODBA trace                             | ODBA          | OD | ODBA events                                   | Not available                                                  |
| Online Recovery Manager trace          | ORTT          | OR | ORS activity                                  | <a href="#">“Online Recovery Manager trace” on page 206</a>    |
| Operations Manager (OM) commands       | OCMD          | OC | Activity related to commands received from OM | Not available                                                  |
| OTMA trace                             | OTMT          | OA | OTMA activity                                 | <a href="#">“OTMA trace” on page 354</a>                       |
| z/OS Resource Recovery Services (RRS)  | RRST          | RR | RRS activity in dependent region(s)           | <a href="#">“Resource Recovery Services trace” on page 658</a> |
| Queue manager trace                    | QMGR          | QM | Queue manager activity                        | <a href="#">“Queue manager trace” on page 680</a>              |
| Security trace                         | SECT          | SE | Security events                               | Not available                                                  |
| Scheduler trace (online only)          | SCHD          | SC | Scheduler activities                          | <a href="#">“Scheduler trace” on page 672</a>                  |
| Shared queues interface trace          | SQTT          | SQ | Shared queues interface activities.           | <a href="#">“Shared queues interface trace” on page 684</a>    |
| Storage Manager trace                  | STRG          | SM | Storage Manager activities                    | <a href="#">“Storage manager trace” on page 675</a>            |
| Transport Manager Subsystem (TMS)      | Not available | TS | TMS activity                                  | Not available                                                  |

**Related concepts**

[“DL/I trace” on page 161](#)

The DL/I trace table is a combined trace consisting of entries from DL/I calls, the DL/I buffer handler, DL/I OPEN/CLOSE, HD space management, lock activity (using PI or IRLM), OSAM, DFP interface, HALDB OLR trace, and ABENDU0427.

### **Finding type-1 trace tables in a dump**

If you do not write the trace to the log data set, IMS formats trace tables as part of an IMS dump.

#### **How to locate trace tables**

The following figure shows where to find the location of each of the traces in a dump.

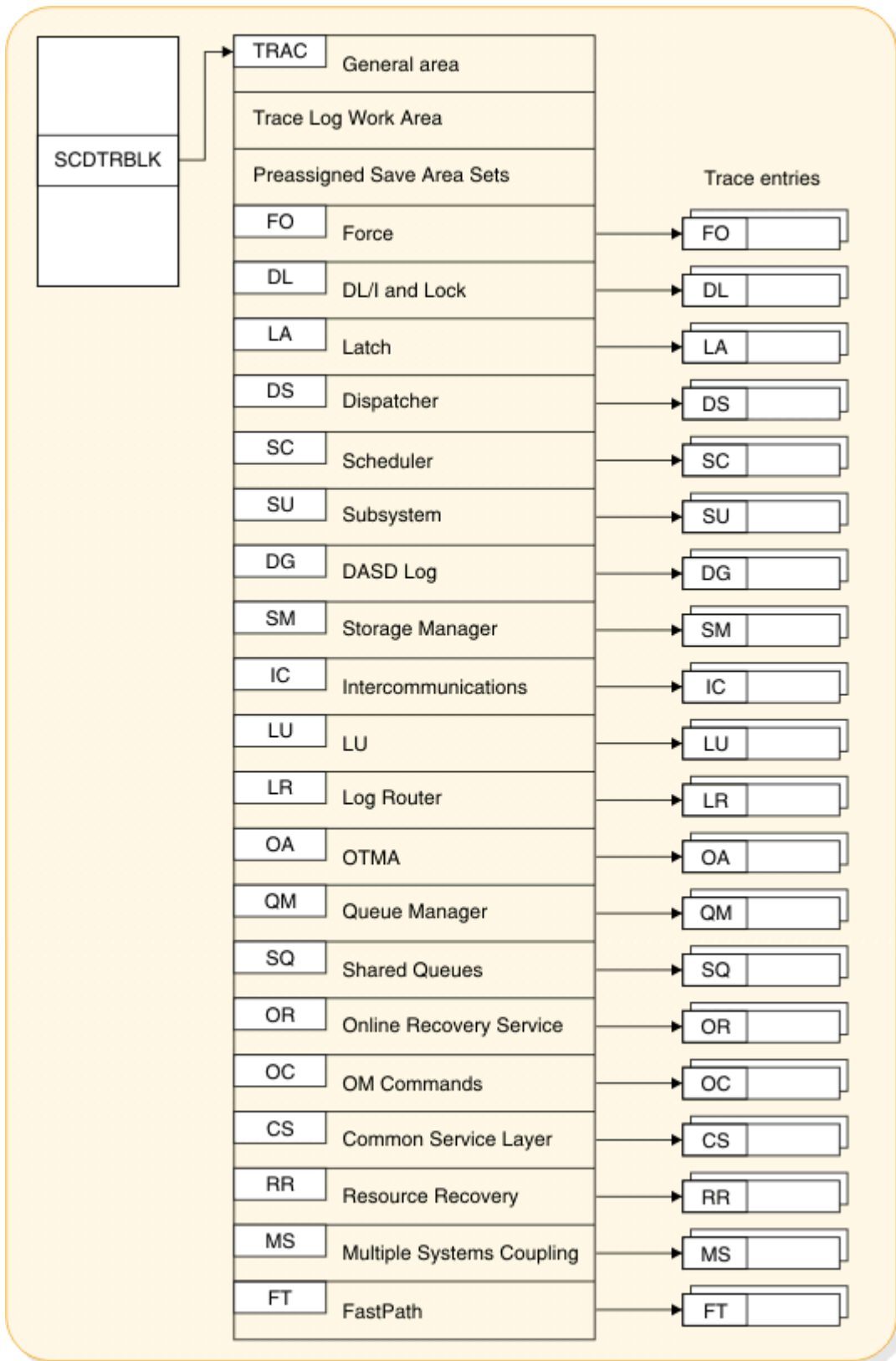


Figure 96. How to locate trace tables

## Format of type-1 trace records

By examining the trace records, you can determine the function that was being traced as well as the order in which a series of system operations took place.

In the example trace record in the following figure, the number in the trace sequence field in each entry identifies where that trace entry fits in the sequence of system operations. In addition, each trace entry provides pertinent information about that function.

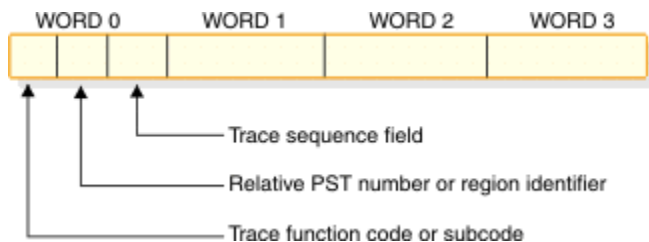


Figure 97. General trace record format

You can find the format of the trace entries by assembling macro IDLIVSAM TRACENT. Assembling IDLIVSAM after each system definition ensures that you have a current mapping of the trace record formats.

## IMS type-1 trace function codes

You use trace function codes to help you diagnose performance problems or other problems with IMS.

The following table shows some of the important functions that are traced by the common trace interface and their location in the trace tables. These function codes are a subset of all trace function codes.

You can also find a one-line description of each trace code in macro DFSTRAE0.

Table 263. Trace function codes

| Trace table   | Function code | Description                                                          |
|---------------|---------------|----------------------------------------------------------------------|
| DL/I and lock | X'0C'         | DL/I OPEN/CLOSE for each data set                                    |
|               | X'30'         | IWAIT called with IXCTL=YES option                                   |
|               | X'31'         | Get space for the segment                                            |
|               | X'32'         | Free space for the segment                                           |
|               | X'34'         | Get space close to root anchor                                       |
|               | X'35'         | HD space management GET /ERE local serialization lock                |
|               | X'36'         | HD space management release local serialization lock /ERE            |
|               | X'60'         | (OSAM) I/O operation initiated                                       |
|               | X'61'         | (OSAM) I/O operation posted                                          |
|               | X'62'         | (OSAM) OPEN/CLOSE/EOV complete                                       |
|               | X'69'         | Sequential buffering: invalidate SB buffers                          |
|               | X'6A'         | Sequential buffering: buffering evaluation                           |
|               | X'6B'         | Sequential buffering: description why SB was/was not used            |
|               | X'6C'         | Sequential buffering: refresh SB buffers after a write               |
|               | X'6F'         | Sequential buffering: search/read call issued by OSAM Buffer Handler |

Table 263. Trace function codes (continued)

| Trace table | Function code | Description                                        |
|-------------|---------------|----------------------------------------------------|
|             | X'80'         | Database authorization request                     |
|             | X'81'         | Database change authorization request              |
|             | X'82'         | Database re-authorization request                  |
|             | X'AA'         | DL/I call analyzer entry for each database call    |
|             | X'AB'         | (VSAM) ABEND U0427                                 |
|             | X'B1'         | Demand space set by backout or DELETE/REPLACE      |
|             | X'B2'         | Free space for backout                             |
|             | X'C4'         | DELETE/REPLACE                                     |
|             | X'C7'         | (PI) Exclusive control deadlock detection          |
|             | X'C8'         | Lock request manager (DFSLMGR0) entry              |
|             | X'C9'         | Lock request manager (DFSLMGR0) exit               |
|             | X'CA'         | (PI) request trace entry                           |
|             | X'CA'—X'08'   | (PI) DL/I call trace entry                         |
|             | X'CB'         | (PI) lock elapsed time entry                       |
|             | X'CC'         | Lock request handler (DFSLRH00)                    |
|             | X'CF'         | I/O Toleration (DFSTOPRO)                          |
|             | X'D0'         | IRLM NOTIFY sent                                   |
|             | X'D1'         | IRLM NOTIFY received                               |
|             | X'D2'         | IRLM status exit                                   |
|             | X'D3'         | IRLM deadlock exit                                 |
|             | X'D5'         | Sysplex data sharing                               |
|             | X'D9'         | HALDB online reorganization trace entry            |
|             | X'DA'         | VSAM JRNAD or UPAD exit                            |
|             | X'DB'         | Search pool for record in range (buffer handler)   |
|             | X'DD'         | Release record ownership (buffer handler)          |
|             | X'DE'         | Retrieve buffer pool statistics (buffer handler)   |
|             | X'DF'         | VSAM verify                                        |
|             | X'E0'         | VSAM PUT                                           |
|             | X'E1'         | Block locate (buffer handler)                      |
|             | X'E2'         | Byte locate (buffer handler)                       |
|             | X'E4'         | Create new ESDS/OSAM LRECL (buffer handler)        |
|             | X'E5'         | Write LRECLs for user (purge) (buffer handler)     |
|             | X'E6'         | Mark record altered (buffer handler)               |
|             | X'E9'         | Free space in buffer pool (BFPL) (buffer handler)  |
|             | X'EA'         | Perform background write function (buffer handler) |
|             | X'EB'         | Byte locate and mark altered (buffer handler)      |

Table 263. Trace function codes (continued)

| Trace table | Function code | Description                                                                        |
|-------------|---------------|------------------------------------------------------------------------------------|
|             | X'EC'         | Mark buffers empty (BFPL) (buffer handler)                                         |
|             | X'ED'         | Checkpoint (buffer handler)                                                        |
|             | X'EE'         | Batch STAE purge at ABEND (buffer handler)                                         |
|             | X'EF'         | OSAM buffer forced write (buffer handler)                                          |
|             | X'F0'         | Retrieve first LRECL by key (buffer handler)                                       |
|             | X'F1'         | Erase logical record (buffer handler)                                              |
|             | X'F2'         | Retrieve by key EQ or GT (buffer handler)                                          |
|             | X'F3'         | Retrieve key EQ or GT—Repair CI (buffer handler)                                   |
|             | X'F4'         | Retrieve by key record to chain from insert logical record (KSDS) (buffer handler) |
|             | X'F8'         | Retrieve next sequential root by key (buffer handler)                              |
|             | X'F9'         | Position by key for image copy (buffer handler)                                    |
|             | X'FA'         | Get next record for image copy (buffer handler)                                    |
| Dispatcher  | X'01'         | FRR driven attempting to SCHEDULE a RESUME SRB in IPOST common (DFSIPOTC)          |
|             | X'02'         | ITASK started (created)                                                            |
|             | X'03'         | ITASK terminated                                                                   |
|             | X'04'         | IWAIT called                                                                       |
|             | X'05'         | ITASK reinstated                                                                   |
|             | X'06'         | IPOST called                                                                       |
|             | X'07'         | IXCTL called                                                                       |
|             | X'08'         | ISWITCH 'TO' invoked                                                               |
|             | X'09'         | Un-initialize ECB called                                                           |
|             | X'0A'         | Dependent region dispatch reattach                                                 |
|             | X'0B'         | Process IMS TCB signoff                                                            |
|             | X'0C'         | Reserved — used by DL/I Open Close                                                 |
|             | X'0D'         | INITECB called                                                                     |
|             | X'0E'         | Memory change done using PC/PT                                                     |
|             | X'0F'         | Dispatcher abend issued                                                            |
|             | X'10'         | Cross memory ISWITCH TO=XM or TO=HOME                                              |
|             | X'11'         | Cross memory state change                                                          |
|             | X'12'         | DFSKPXT store POST code in ECB                                                     |
|             | X'13'         | DFSKPXT called (z/OS branch-entry local POST)                                      |
|             | X'14'         | DFSCIR called to create an ITASK                                                   |
|             | X'15'         | DFSKPXT issued z/OS branch-entry local POST                                        |
|             | X'16'         | Post exit posted ECB enqueue                                                       |
|             | X'17'         | Post exit resume target IMS TCB                                                    |



Table 263. Trace function codes (continued)

| Trace table                           | Function code | Description                                   |
|---------------------------------------|---------------|-----------------------------------------------|
|                                       | X'18'         | IPOST common store post code in ECB           |
|                                       | X'19'         | IPOST common posted ECB enqueue               |
|                                       | X'1A'         | IPOST common resume target IMS TCB            |
|                                       | X'1B'         | INITECB ECB store results                     |
|                                       | X'1C'         | INITECB posted ECB enqueue                    |
|                                       | X'1D'         | Suspend back out resume issued                |
|                                       | X'1E'         | SRB scheduled for alternate IPOST             |
|                                       | X'1F'         | IPOST called ('SAP=')                         |
|                                       | X'20'         | Dependent region shutdown ISWITCH             |
|                                       | X'21'         | Entry to POST-Exit routine                    |
|                                       | X'22'         | Reserved                                      |
|                                       | X'23'         | ISERWAIT called                               |
|                                       | X'24'         | ISWITCH 'TO' with stack invoked               |
|                                       | X'25'         | Reserved                                      |
|                                       | X'26'         | Branch entry SCP post                         |
|                                       | X'27'         | Suspend IMS TCB                               |
|                                       | X'28'         | Dependent region open dispatcher — sign on    |
|                                       | X'29'         | ISWITCH TO=UNSTACK                            |
|                                       | X'2A'         | IMS list post called                          |
|                                       | X'2B'         | SCP WAIT issued                               |
|                                       | X'2C'         | SCP WAIT completed                            |
|                                       | X'2D'         | ISWITCH 'RET' invoked                         |
|                                       | X'2E'         | Shutdown ISWITCH reinstated                   |
|                                       | X'2F'         | Dependent region open dispatcher — TCB switch |
| z/OS Resource Recovery Services (RRS) | X'A5'         | RRS calls                                     |
| Scheduler                             | X'41'         | Scheduling starts                             |
|                                       | X'42'         | Block mover                                   |
|                                       | X'43'         | Scheduling ends                               |
|                                       | X'44'         | IRC started                                   |
|                                       | X'45'         | TMS00 started                                 |
|                                       | X'46'         | TMS00 finished                                |
|                                       | X'47'         | APPC extract call made                        |
|                                       | X'48'         | Scheduling failed                             |
| Queue Manager                         | X'4E'         | Information related to the queue manager      |
| DASD log                              | X'50'         | Logical logger trace entry.                   |

Table 263. Trace function codes (continued)

| Trace table     | Function code | Description                                                                                                                                             |
|-----------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | X'51'         | Physical logger master ITASK trace entry                                                                                                                |
|                 | X'52'         | Physical logger buffer ITASK trace entry                                                                                                                |
|                 | X'53'         | Physical logger setup ITASK trace entry                                                                                                                 |
|                 | X'54'         | Physical logger WADS ITASK trace entry                                                                                                                  |
|                 | X'55'         | Physical logger READ ITASK trace entry                                                                                                                  |
| External        | X'57'         | Created by the module that operates in the IMS control region                                                                                           |
| Subsystem       | X'58'         | Created by the module that operates in the IMS dependent region                                                                                         |
| Storage Manager | X'5F'         | Storage Manager trace entry written on pool allocation Buffer Get and Buffer release (AOIP, CESS, CIOP, CMDP, DYNP, EMHB, FPWP, HIOP, SPAP, LUMC, LUMP) |
| Latch           | X'70'         | Information related to the latch manager and the use manager                                                                                            |
|                 | X'76'         | Reserved                                                                                                                                                |
| Fast Path       | X'9C'         | The FP Notify trace code                                                                                                                                |
|                 | X'9D'         | The FP General trace code                                                                                                                               |
|                 | X'9E'         | Fast Path log router interface                                                                                                                          |
|                 | X'9F'         | Fast Path log router interface                                                                                                                          |
| Log Router      | X'38'         | Created by various log router functions                                                                                                                 |

### Related concepts

[“Dispatcher trace” on page 634](#)

When you use the **/TRACE SET ON TABLE DISP** command, IMS enables the dispatcher trace to an internal table. This internal table is formatted in any dump that is formatted by IMS.

[“Latch trace” on page 676](#)

When you use the **/TRACE SET ON TABLE LATC** command, IMS traces events related to its internal serialization services (latch manager, use manager, and system locate control function) to an internal table.

### Related tasks

[“Resource Recovery Services trace” on page 658](#)

The Resource Recovery Services trace (RRST) provides information about relevant z/OS Resource Recovery Services (RRS) events in the IMS dependent region. Use the trace under direction of IBM Software Support when problems are suspected in the RRS area.

### Related reference

[“External subsystem trace” on page 643](#)

You enable the external subsystem trace by using the **/TRACE SET ON TABLE SUBS** command. When you specify **OPTION LOG**, IMS writes the trace externally as type X'67FA' records.

[“Scheduler trace” on page 672](#)

When you use the **/TRACE SET ON TABLE SCHD** command, IMS enables the scheduler trace. When you specify **OPTION LOG**, IMS sends these entries to the log as type X'67FA' records.

[“Storage manager trace” on page 675](#)

The storage manager trace writes a record each time it is called to allocate a pool, get a buffer, or release a buffer. The storage manager traces requests from the following pools: AOIP, CESS, CIOP, CMDP, DYNP, EMHB, FPWP, HIOP, LUMC, LUMP, and SPAP.

“Queue manager trace” on page 680

The queue manager trace provides information about relevant queue manager functional and exceptional events. Use the trace under the direction of IBM support personnel when problems are suspected in the queue manager area.

“Shared queues interface trace” on page 684

The shared queues interface trace provides information about errors associated with the interface between IMS and CQS.

“Fast Path trace” on page 684

When you use the **/TRACE SET ON TABLE FPTT** command, IMS enables the Fast Path trace. The Fast Path trace resides in the internal IMS trace tables, with the OPTION LOG parameter causing the trace to also be written to the IMS logs.

“Fast Path tracker trace entries” on page 459

Use Trace record 9E01 - DBFDT210 redo record processor module entry through Trace record 9F74 - DBFDT400 write to analyze the Fast Path tracker trace entries.

## Common Service Layer trace

The Common Service Layer trace (CSLT) provides information about the interactions between IMS and the Common Service Layer, including how IMS interacts with the Operations Manager (OM), the Resource Manager (RM), and the Structured Call Interface (SCI).

You can turn on the Common Service Layer trace during online operation by using the **/TRACE** command. Each trace entry is X'20' bytes long. You can specify trace output destination and tracing volume on the **/TRACE** command.

If you send the output to the common trace table, you can format the table using the Offline Dump Formatter under IPCS, using either the VERBX command or the IMS Dump Formatter panels. If you send the output to an external data set, you can use the File Select and Formatting Print utility (DFSERA10) with exit routine DFSERA60 to format the trace entries.

To locate the common service layer trace in a dump, look for eye catcher \*\*CSTR.

### Format of Common Service Layer trace records

The Common Service Layer trace function and subfunction codes are listed, and the trace (low level) record format these functions with these subfunction codes (SC) are shown.

*Table 264. Common Service Layer trace function and subfunction codes*

| Subfunction codes (SC) | Function                        |
|------------------------|---------------------------------|
| X'01'                  | Process flow                    |
| X'02'                  | Storage error                   |
| X'03'                  | Load or delete error            |
| X'05'                  | Parameter validation error      |
| X'09'                  | AWE error                       |
| X'0A'                  | Latch error                     |
| X'0F'                  | Miscellaneous MVS service error |
| X'11'                  | CQS service error               |
| X'12'                  | SCI service error               |
| X'13'                  | RM service error                |

Table 264. Common Service Layer trace function and subfunction codes (continued)

| Subfunction codes (SC) | Function                                     |
|------------------------|----------------------------------------------|
| X'14'                  | OM service error                             |
| X'15'                  | Unknown function                             |
| X'16'                  | Parameter list version error                 |
| X'50'                  | SCI Input exit                               |
| X'51'                  | SCI Notify exit                              |
| X'80'                  | Terminal logon                               |
| X'81'                  | Terminal logoff                              |
| X'82'                  | User signon                                  |
| X'83'                  | User signoff                                 |
| X'84'                  | DFSRMAM0 query interface                     |
| X'85'                  | DFSRMUP0 update interface                    |
| X'86'                  | RM resource entry                            |
| X'90'                  | Miscellaneous RM directive processing errors |

### Subfunction code trace record format

The following diagram shows the format of the trace records for each of the subfunction codes listed above. Each trace record has a trace function code of X'A2' and is X'20' bytes long.

```

Word 0   - byte 1 - Trace function code
          - byte 2 - Trace function subcode
          - byte 3-4 - Trace record sequence number
Words 1-5 - Contains information about the activity being traced.
           The information recorded in this part of the trace record
           depends on the trace function subcode of the trace record.
Words 6-7 - Timestamp (STCK value)
    
```

The data in words 1-5, which is specific to each trace entry, is described in the following diagrams:

```

Trace function subcode = X'01'
Description: Process flow (Begin Process and Normal Process)
    
```

```

Word 1   - byte 1 - Service code
          - byte 2 - Object type
          - bytes 3-4 - Module identifier
Word 2   - Not used
Word 3   - Not used
Word 4   - Not used
Word 5   - Thread ECB address
    
```

```

Trace function subcode = X'01'
Description: Process flow (End Process)
    
```

```

Word 1   - byte 1 - Service code
          - byte 2 - Object type
          - bytes 3-4 - Module identifier
Word 2   - Not used
Word 3   - Not used
Word 4   - Return code
Word 5   - Reason code
    
```

```

Trace function subcode = X'02'
Description: Storage Request Error
    
```

```

Word 1   - byte 1 - Service code
          - byte 2 - Object type
    
```

Word 2 - bytes 3-4 - Module identifier  
Word 2 - Return code  
Word 3 - Storage length  
Word 4 - Storage address  
Word 5 - Thread ECB address

Trace function subcode = X'03'  
Description: Module LOAD/DELETE Error

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type  
Word 1 - bytes 3-4 - Module identifier  
Word 2 - Return code  
Word 3 - bytes 1-2 - Target module identifier  
Word 3 - bytes 3-4 - Not used  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'04'  
Description: Proclib/Execute Parameter Error

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type  
Word 1 - bytes 3-4 - Module identifier  
Word 2 - Return code  
Word 3 - Not used  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'05'  
Description: Parameter Validation Error

Word 1 - byte 1 - Not used  
Word 1 - byte 2 - Object type  
Words 2-5 - Parameter Value

Trace function subcode = X'07'  
Description: TCB/Thread Error

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type  
Word 1 - bytes 3-4 - Module identifier  
Word 2 - Return code  
Word 3 - Not used  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'09'  
Description: AWE Error (Create AWE Queue Server, Get AWE, Enq AWE)

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type  
Word 1 - bytes 3-4 - Module identifier  
Word 2 - Return code  
Word 3 - Not used  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'09'  
Description: AWE Error (Invalid AWE)

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type  
Word 1 - bytes 3-4 - Module identifier  
Word 2 - byte 1 - Function code  
Word 2 - bytes 2-4 - Not used  
Word 3 - Address of invalid AWE  
Word 4 - Enqueueer's ECB  
Word 5 - Thread ECB address

Trace function subcode = X'0A'  
Description: LATCH Error

Word 1 - byte 1 - Service code  
Word 1 - byte 2 - Object type

```
Word 2      - bytes 3-4 - Module identifier
Word 3      - Return code
Word 4      - Not used
Word 5      - Thread ECB address
```

Trace function subcode = X'0F'  
Description: Miscellaneous MVS Service Error

```
Word 1      - byte 1 - Service code
             - byte 2 - Object type
             - bytes 3-4 - Module identifier
Word 2      - Return code
Word 3      - Reason code
Word 4      - Not used
Word 5      - Thread ECB address
```

Trace function subcode = X'11'  
Description: CQS Service Error

```
Word 1      - byte 1 - Service code
             - byte 2 - Object type
             - bytes 3-4 - Module identifier
Word 2      - Return code
Word 3      - Reason code
Word 4      - Not used
Word 5      - Thread ECB address
```

Trace function subcode = X'12'  
Description: SCI Service Error

```
Word 1      - byte 1 - Service code
             - byte 2 - Object type
             - bytes 3-4 - Module identifier
Word 2      - Return code
Word 3      - Reason code
Word 4      - Not used
Words 4-5   - Target member name or zero
```

Trace function subcode = X'13'  
Description: RM Service Error

```
Word 1      - byte 1 - Service code
             - byte 2 - Object type
             - bytes 3-4 - Module identifier
Word 2      - Return code
Word 3      - Reason code
Word 4      - Not used
Words 4-5   - Target member name or zero
```

Trace function subcode = X'14'  
Description: OM Service Error

```
Word 1      - byte 1 - Service code
             - byte 2 - Object type
             - bytes 3-4 - Module identifier
Word 2      - Return code
Word 3      - Reason code
Word 4      - Not used
Words 4-5   - Target member name or zero
```

There are two formats used for Trace Subcode X'15':

Trace function subcode = X'15'  
Description: Unknown Function Exit Errors

```
Word 1      - bytes 1-2 - Function Code
             - bytes 3-4 - Module identifier
Words 2-5   - SCI Token
```

Trace function subcode = X'15'  
Description: Unknown Function Exit Errors

```
Word 1      - bytes 1-2 - Function Code
```

Words 2-3 - bytes 3-4 - Module identifier  
Words 3-5 - Subject member name  
Words 4-5 - Subject member type and subtype

Trace function subcode = X'16'  
Description: Parameter list version errors

Word 1 - byte 1 - Not used  
- byte 2 - Object type  
- bytes 3-4 - Module identifier  
Words 2 - Parameter version  
Words 3-4 - Member name  
Word 5 - Member version

Trace function subcode = X'50'  
Description: SCI Input Exit

Word 1 - byte 1 - Service code  
- byte 2 - Flag  
- bytes 3-4 - Source member type  
Word 2 - Function code  
Word 3 - Subfunction code  
Words 4-5 - Source member name

Trace function subcode = X'51'  
Description: SCI Notify Exit

Word 1 - byte 1 - Service code  
- byte 2 - Flag  
- bytes 3-4 - Source member type  
Word 2 - Source member type  
Word 3 - Event  
Words 4-5 - Source member name

Trace function subcode = X'80'  
Description: Logon Process

Word 1 - bytes 1-2 - Return code  
- byte 3 - CLBSRM1  
- byte 4 - CLBSRM2  
Words 2-3 - Node name  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'81'  
Description: Logoff Process

Word 1 - bytes 1-2 - Return code  
- byte 3 - CLBSRM1  
- byte 4 - CLBSRM2  
Words 2-3 - Node name  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'82'  
Description: Signon Process

Word 1 - bytes 1-2 - Return code  
- byte 3 - CLBSRM1  
- byte 4 - CLBSRM2  
Words 2-3 - User structure name  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'83'  
Description: Signoff Process

Word 1 - bytes 1-2 - Return code  
- byte 3 - CLBSRM1  
- byte 4 - CLBSRM2  
Words 2-3 - User structure name  
Word 4 - Not used  
Word 5 - Thread ECB address

Trace function subcode = X'84'  
 Description: DFSRMAM0 query interface

- Word 1
  - byte 1 - RMAP flag 1
  - byte 2 - RMAPE flag 1
  - byte 3 - RMAPE flag 2
  - byte 4 - RMAPE flag 3
- Words 2-3
  - Resource name
- Word 4
  - Data pointer
- Word 5
  - Return code

Trace function subcode = X'85'  
 Description: DFSRMUP0 update interface

- Word 1
  - byte 1 - RMAP flag 1
  - byte 2 - RMAPE flag 1
  - byte 3 - RMAPE flag 2
  - byte 4 - RMAPE flag 3
- Word 2
  - Resource pointer
- Word 3
  - Not used
- Word 4
  - Data pointer
- Word 5
  - Return code

Trace function subcode = X'86'  
 Description: RM Resource Entry trace

- Word 1
  - byte 1 - Service code
  - byte 2 - Condition code
  - bytes 3-4 - Module identifier
- Words 2-3
  - Resource name
- Word 4
  - byte 1 - Resource Type
  - byte 2 - Not used
  - byte 3 - Input version number (last byte)
  - byte 4 - Output version number (last byte)
- Word 5
  - Thread ECB address

Trace function subcode = X'90'  
 Description: Miscellaneous Directive Processing errors

- Word 1
  - byte 1 - Service code
  - byte 2 - Not used
  - bytes 3-4 - Module identifier
- Words 2-3
  - Process name
- Word 4
  - Process type
- Word 5
  - Not used

## Dispatcher trace

When you use the **/TRACE SET ON TABLE DISP** command, IMS enables the dispatcher trace to an internal table. This internal table is formatted in any dump that is formatted by IMS.

When you use **OPTION LOG**, IMS sends the entries to the log as type X'67FA' records. You can select and format these log entries by using the utility **DFSERA10** with exit **DFSERA30**.

The following table shows the general format of a dispatcher trace entry.

Table 265. Dispatcher trace record format

| WORD 0 |   |            | WORD 1 | WORD 2 | WORD 3 | WORD 4 | WORD 5 | WORD 6 | WORD 7        |
|--------|---|------------|--------|--------|--------|--------|--------|--------|---------------|
| I      | T | SEQ<br>NUM |        |        |        |        |        |        | TIME<br>STAMP |

where

**represents**

**I**

One-byte trace ID field. This byte indicates the type of the trace entry.

**T**

One-byte TCB ID. This byte indicates the IMS TCB type which made the trace entry.



The dispatcher trace formatting usually includes the functional area. If you need this information because the trace is in a raw format, the codes can be obtained by assembling the following macro statement DFSKDT FUNC=EQUATES.

### SEQ NUM

Two-byte trace sequence number assigned by the IMS trace component.

### TIME STAMP

Bytes 3 through 6 of the system clock (STCK) at the time the trace entry was created.

Words 1 through 6 contain data specific to each trace entry, as described below: The letter A followed by parentheses () indicates "address of" in all dispatcher trace entries listed below.

```
TRACE ID = X'01'
DESC = FRR driven attempting to schedule a RESUME SRB
      in IPOST common (DFSIPOTC)
word 1 - A(Target ECB being IPOSTed). If high X'80' on,
        this indicates recursive FRR entry
word 2 - SAPCNTRL field from target ECB's SAP
word 3 - Abend code
word 4 - A(target dispatcher work area)
word 5 - IPOST common caller's return address
word 6 - IPOST common caller's R13
```

```
TRACE ID = X'02'
DESC = ECB dispatch - ITASK started (created)

word 1 - A(ITASK ECB)
word 2 - ECB contents
word 3 - A(ITASK SAP)
word 4 - EPFFLAGS field from ECB prefix
word 5 - A(CULE) if present in ECB prefix
word 6 - A(Routine to get control)
```

```
TRACE ID = X'03'
DESC = ECB dispatch - ITASK terminated

word 1 - A(ITASK ECB)
word 2 - ECB contents
word 3 - A(ITASK SAP)
word 4 - EPFFLAGS field from ECB prefix
word 5 - A(CULE) if present in ECB prefix
word 6 - 0
```

```
TRACE ID = X'04'
DESC = IWAIT called

word 1 - A(ITASK ECB)
word 2 - ECB contents prior to IWAIT
word 3 - IWAIT return address
word 4 - 0
word 5 - 0
word 6 - SAPCNTRL contents
```

```
TRACE ID = X'05'
DESC = ECB dispatch - ITASK reinstated

word 1 - A(ITASK ECB)
word 2 - ECB contents
word 3 - SAPCNTRL field from ITASK's SAP
word 4 - EPFFLAGS field from ECB prefix
word 5 - Reinstatement address (return address)
word 6 - 0
```

```
TRACE ID = X'06'
DESC = IPOST called

word 1 - A(POSTer's ECB) (A(TCB) if ITASK=NO)
word 2 - IPOST return
word 3 - A(ECB to be POSTed)
word 4 - Contents of ECB before IPOST
word 5 - POST code at entry to IPOST (may be complimented)
word 6 - 0
```

**TRACE ID** = X'07'  
**DESC** = IXCTL called

word 1 - A(Current ITASK ECB)  
word 2 - A(IXCTL target ECB)  
word 3 - IXCTL return address  
word 4 - A(CULE) from current ECB prefix  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'08'  
**DESC** = ISWITCH TO= invoked

word 1 - A(Current ECB)  
word 2 - ISWITCH return address  
word 3 - A(target dispatcher work area)  
word 4 - SAPCNTRL field from ECB's SAP  
word 5 - SAPXFLAG contents  
word 6 - 0

**TRACE ID** = X'09'  
**DESC** = UN-INITIALIZE ECB called

word 1 - A(Target ECB)  
word 2 - UNINIT return address  
word 3 - UNINIT return code  
word 4 - EPFFLAGS from ECB prefix  
word 5 - ECB contents  
word 6 - 0

**TRACE ID** = X'0A'  
**DESC** = Dependent region reattach

word 1 - A(Related PST)  
word 2 - A(Dependent region dispatcher work area)  
word 3 - SAPCNTRL field from PST's SAP  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'0B'  
**DESC** = Process IMS TCB signoff

word 1 - A(Related PST)  
word 2 - A(Released dispatcher work area)  
word 3 - Signoff return address  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'0D'  
**DESC** = INITECB called

word 1 - A(Current ECB)  
word 2 - INITECB return address  
word 3 - A(ECB being initialized)  
word 4 - Contents of ECB before being initialized  
word 5 - INITECB RC  
word 6 - If INITECB RC=0C, WD5 = A(SAP) from target ECB prefix.  
If INITECB RC=10, WD5 = A(dispatcher work area)  
from target ECB prefix.

**TRACE ID** = X'0E'  
**DESC** = Memory change done via PC/PT

word 1 - A(Current ECB) (X'80' on=PC; off=PT)  
word 2 - Old primary ASID | Secondary ASID  
word 3 - If Word 1 indicates PT: PKM ASID for PT  
If Word 1 indicates PC: PC # issued  
word 4 - A(Current dispatcher work area)  
word 5 - New Primary ASN-Second-Table-Entry Instance Number  
(PASTEIN), or 0 if none.  
word 6 - High half word = 0. Low half word = old PKM.

**TRACE ID** = X'0F'  
**DESC** = **Dispatcher ABEND issued ("other diagnostics" dependent on ABEND issuer)**  
word 1 - A(Current ECB)  
word 2 - Other diagnostics  
word 3 - ABEND code | reason code  
word 4 - Other diagnostics (usually the dispatcher work area address of the abending TCB)  
word 5 - Other diagnostics  
word 6 - Other diagnostics

**TRACE ID** = X'10'  
**DESC** = **Cross memory ISWITCH TO=XM or TO=HOME**  
word 1 - A(Current ECB)  
word 2 - ISWITCH return address  
word 3 - Target code (00=HOME, 01=CTL, 02=DLI)  
word 4 - SAPCNTRL field from ECB's SAP  
word 5 - Home ASID of target | Primary ASID of target  
word 6 - SAPXFLAG contents

**TRACE ID** = X'11'  
**DESC** = **Cross memory state change**  
word 1 - A(Current ECB)  
word 2 - Old primary ASID | Secondary ASID  
word 3 - New primary ASID | Secondary ASID  
word 4 - A(current dispatcher work area)  
word 5 - High half word = low 16 bits of new Primary ASN-Second-Table-Entry Instance Number (PASTEIN), or zero if none. Low half word = low 16 bits of new Secondary ASN-Second-Table-Entry Instance Number (SASTEIN), or zero if none.  
word 6 - High half word = New PSW Key Mask (PKM) . Low half word = Old PKM.

**TRACE ID** = X'12'  
**DESC** = **DFSKPXT-POST code stored in ECB (ECB was not waiting)**  
word 1 - A(ECB) to be POSTed  
word 2 - POST code  
word 3 - Contents of ECB on prior to store  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'13'  
**DESC** = **DFSKPXT-Special MVS branch-entry POST call**  
word 1 - A(Caller's TCB) (0 if SRB)  
word 2 - Caller's return address  
word 3 - A(ECB) to be POSTed  
word 4 - Caller's home ASID  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'14'  
**DESC** = **DFSCIR called to create an ITASK**  
word 1 - A(ECB) or -A(ECB list)  
word 2 - ITASK type code  
word 3 - DFSCIR return address  
word 4 - A(ITASK main program)  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'15'  
**DESC** = **DFSKPXT issued branch-entry MVS POST (local)**  
word 1 - A(ECB) to be POSTed  
word 2 - ECB POST code  
word 3 - ECB contents prior to the POST  
word 4 - 0

word 5 - 0  
word 6 - 0

**TRACE ID** = X'16'  
**DESC** = POST exit POSTed ECB enqueue

word 1 - A(ECB) being POSTed  
word 2 - ECB POST code  
word 3 - Previous POST queue header contents  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'17'  
**DESC** = POST exit RESUME target MVS TCB

word 1 - A(TCB) (SRB=0)  
word 2 - Home ASID | Primary ASID  
word 3 - Target TCB's ASID  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'18'  
**DESC** = IPOST common store POST code in ECB (ECB was not waiting)

word 1 - A(ECB) being IPOSTed  
word 2 - POST code  
word 3 - ECB contents prior to the IPOST  
word 4 - A(ECB's dispatcher work area)  
word 5 - IPOST common caller's return address  
word 6 - 0

**TRACE ID** = X'19'  
**DESC** = IPOST common POSTed ECB enqueue

word 1 - A(ECB) being enqueued  
word 2 - ECB POST code  
word 3 - Previous POSTed queue header contents  
word 4 - A(ECB's dispatcher work area)  
word 5 - IPOST common caller's return address  
word 6 - 0

**TRACE ID** = X'1A'  
**DESC** = IPOST common RESUME target IMS TCB

word 1 - A(current TCB) (0=SRB)  
word 2 - Home ASID or Primary ASID  
word 3 - Target TCB's home ASID  
word 4 - A(resumed TCB's dispatcher work area)  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'1B'  
**DESC** = INITECB ECB store results

word 1 - A(ECB) being initialized  
word 2 - WAIT code being stored into ECB  
word 3 - ECB contents prior to INITECB store  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'1C'  
**DESC** = INITECB POSTed ECB enqueue

word 1 - A(ECB) being initialized  
word 2 - ECB POST code  
word 3 - Previous POSTed queue header contents  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'1D'  
**DESC** = **SUSPEND back out RESUME issued**

word 1 - POSTed queue header contents  
word 2 - Home ASID | Primary ASID  
word 3 - A(SRB) (0 = no SRB)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'1E'  
**DESC** = **SRB scheduled for alternate IPOST**

word 1 - A(ECB) to be IPOSTed  
word 2 - Primary ASID | target ASID  
word 3 - A(IPOST SRB) (0 if MVS branch entry XM-POST)  
word 4 - A(current ASCB)  
word 5 - POST code  
word 6 - 0

**TRACE ID** = X'1F'  
**DESC** = **IPOST called with TOSAP= option**

word 1 - A(Poster's ECB) (A(TCB) if ITASK=NO)  
word 2 - IPOST return address  
word 3 - A(ECB to be POSTed)  
word 4 - 0  
word 5 - POST code at entry to IPOST (may be complimented)  
word 6 - 0

**TRACE ID** = X'20'  
**DESC** = **Dependent region shutdown ISWITCH**

word 1 - A(Related PST)  
word 2 - A(Special exit)  
word 3 - SAPCNTRL field from PST's SAP  
word 4 - A(Home dispatcher work area)  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'21'  
**DESC** = **Entry to Post-Exit Routine**

word 1 - A(ECB) being POSTed  
word 2 - ECB Contents  
word 3 - EPFFLAGS from ECB prefix  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'22'  
**DESC** = **ABTERM ISWITCH entered**

word 1 - A(ECB) to be switched  
word 2 - ECB contents  
word 3 - SAPCNTRL contents  
word 4 - SAPCNTRL2 contents  
word 5 - Posted Q contents  
word 6 - SAPCMEM | SAPCFLGS

**TRACE ID** = X'23'  
**DESC** = **ISERWAIT called**

word 1 - A(ITASK ECB)  
word 2 - ECB contents prior to ISERWAIT  
word 3 - ISERWAIT return address  
word 4 - 0  
word 5 - 0  
word 6 - SAPCNTRL contents

**TRACE ID** = X'24'  
**DESC** = **ISWITCH TO=, STACK=YES called**

word 1 - A(Current ECB)

word 2 - ISWITCH return address  
word 3 - A(Target dispatcher work area)  
word 4 - SAPCNTRL field from ITASK's SAP  
word 5 - SAPXFLAG contents  
word 6 - 0

**TRACE ID** = X'25'  
**DESC** = **POST ABTERM ISWITCH**

word 1 - A(ECB) to be switched  
word 2 - ECB POST code  
word 3 - previous posted Q contents  
word 4 - A(Target dispatcher work area)  
word 5 - IPOTC/IPEXT caller's return  
word 6 - 0

**TRACE ID** = X'26'  
**DESC** = **Branch entry SCP POST**

word 1 - A(ECB) to be POSTed  
word 2 - ECB POST code  
word 3 - A(ASCB) of ECB's address space  
word 4 - A(Current TCB)  
word 5 - A(Current ASCB)  
word 6 - 0

**TRACE ID** = X'27'  
**DESC** = **SUSPEND IMS TCB**

word 1 - A(Related PST) (0 if not a dependent region/LSD)  
word 2 - Home ASID | Primary ASID  
word 3 - A(Suspended dispatcher work area)  
word 4 - A(TCB being suspended)  
word 5 - Low order word of STORE CLOCK (STCK)  
word 6 - High order word of STORE CLOCK (STCK)

**TRACE ID** = X'28'  
**DESC** = **Dependent region open dispatcher-signon**

word 1 - A(Related PST)  
word 2 - Home ASID  
word 3 - A(Current TCB)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'29'  
**DESC** = **ISWITCH TO=UNSTACK**

word 1 - A(Current ECB)  
word 2 - ISWITCH return address  
word 3 - X'80000000'  
word 4 - SAPCNTRL field from ECB's SAP  
word 5 - SAPXFLAG contents  
word 6 - 0

**TRACE ID** = X'2A'  
**DESC** = **IMS list IPOST called**

word 1 - A(ECB) to be IPOSTed  
word 2 - List IPOST return address  
word 3 - A(POST list)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'2B'  
**DESC** = **SCP WAIT issued (SVC WAIT)**

word 1 - A(WAIT ECB)  
word 2 - SCP WAIT return address  
word 3 - A(Current TCB)  
word 4 - ECB contents prior to WAIT  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'2C'  
**DESC** = SCP WAIT complete (SVC WAIT)

word 1 - A(WAIT ECB)  
word 2 - ECB POST code  
word 3 - A(Current TCB)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'2D'  
**DESC** = ISWITCH TO=RET called

word 1 - A(Current ECB)  
word 2 - ISWITCH return address  
word 3 - 0  
word 4 - SAPCNTRL field from ECB's SAP  
word 5 - SAPXFLAG contents  
word 6 - 0

**TRACE ID** = X'2E'  
**DESC** = Shutdown ISWITCH reinstate

word 1 - A(PST)  
word 2 - A(Return save area)  
word 3 - A(Shutdown ECB)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'2F'  
**DESC** = Dependent region open dispatcher-TCB switch

word 1 - A(Related PST)  
word 2 - A(Previous TCB)  
word 3 - A(Current TCB)  
word 4 - 0  
word 5 - 0  
word 6 - 0

**TRACE ID** = X'30'  
**DESC** = IWAIT called with IXCTL=YES option

word 1 - A(Current ECB)  
word 2 - ECB Contents prior to IWAIT  
word 3 - IWAIT Return address  
word 4 - A(Target ECB)  
word 5 - Target ECB Contents  
word 6 - 0

### Example of a dispatcher trace

```

**DTR          DISPATCHER TRACE
*****
***TRACE PRINTED FROM OLDEST TO MOST CURRENT ENTRY**
*****
FUNCTION        WORD 0      WORD 1      WORD 2      WORD 3      WORD 4      WORD 5      WORD 6      WORD 7
XM ISWITCH STK 10035E11  05B5A060  80BBE2E8  80000002  00800001  001B001B  00000000  9AB7A070  MPP
TO=XMDLI
MEM CHANGE     11035E12  05B5A060  001B001B  0084001B  00B16A40  00000000  00000000  9AB7A1B3  MPP
IPOST( ECB=)   06035E17  05B5A060  80B8F516  00B21140  80B48CD7  40C1E6C5  00000000  9AB7A23D  MPP
AWE
IPC ENQ        19015E18  00B21140  40C1E6C5  FF4B7340  00B48CC0  80BE4208  00000000  9AB7A2CB  LOG
AWE
IPC RESUME     1A015E19  006DEE88  001B0084  00000082  00B48CC0  00000000  00000000  9AB7A3FC  LOG
ISERWAIT      23035E1A  85B5A060  00000000  80B8F602  00000000  00000000  00000000  9AB7A5AC  MPP
IECB STORE    1B035E1B  05B5A060  80B16A57  00000000  00000000  00000000  00000000  9AB7A671  MPP
SUSPEND       27035E1C  05B5A060  001B0084  00B16A40  00000000  00000000  00000000  9AB7A6CE  MPP
XM ISWITCH STK 10035E1E  05B4B060  867851F0  80000001  00000001  00320032  00000000  9AB7A7F1  MPP
TO=XMCTL
MEM CHANGE     11035E1F  05B4B060  00320032  00820032  00B22E00  00000000  00000000  9AB7A92D  MPP
IPOST( ECB=)   06FE5E25  006D77F0  80B91FA6  00BA156C  80B48417  40E3D9C1  00000000  9AB7A93D  N/A
TRA
IPC ENQ        19025E26  00BA156C  40E3D9C1  FF4B7C00  00B48400  80BE4208  00000000  9AB7A9A1  CTL
TRA

```

|                |          |          |          |          |          |          |          |          |     |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|-----|
| IPC RESUME     | 1A025E27 | 006D77F0 | 00820082 | 00000082 | 00B48400 | 00000000 | 00000000 | 9AB7A9F2 | CTL |
| RE-DISPATCH    | 05015E28 | 00B21140 | 40C1E6C5 | 40000000 | 00000000 | 801504A6 | 00000000 | 9AB7ABA1 | LOG |
| IWAIT          | 04015E2C | 00B21140 | 00C1E6C5 | 801504A6 | 00000000 | 00000000 | 00000000 | 9AB7AC31 | LOG |
| AWE            |          |          |          |          |          |          |          |          |     |
| ISWITCH UNSTK  | 29035E2E | 05B4B060 | 86785246 | 80000000 | 00000041 | 00000000 | 00000000 | 9AB7AD61 | MPP |
| IECB STORE     | 1B015E2F | 00B21140 | 80B48CD7 | 00C1E6C5 | 00000000 | 00000000 | 00000000 | 9AB7AF15 | LOG |
| SUSPEND        | 27015E30 | 00000000 | 00820082 | 00B48CC0 | 00000000 | 00000000 | 00000000 | 9AB7AF7C | LOG |
| RE-DISPATCH    | 05035E31 | 05B4B060 | 00025EE4 | 00000003 | 00000000 | 00B22E00 | 00000000 | 9AB7AF8F | MPP |
| MEM CHANGE     | 11035E32 | 05B4B060 | 00820032 | 00320032 | 00B22E00 | 00000000 | 00000000 | 9AB7B04E | MPP |
| ITASK START    | 02025E33 | 00BA156C | 40E3D9C1 | 064BC040 | 00000000 | 066C6440 | 00B7E7E0 | 9AB7B171 | CTL |
| TRA            |          |          |          |          |          |          |          |          |     |
| IPOST(ECB=)    | 06FE5E34 | 00000000 | 8007EAB8 | 05B37060 | 80AF3917 | 801A1D2C | 00000000 | 9AB7B1C7 | N/A |
| VSM            |          |          |          |          |          |          |          |          |     |
| IPC ENQ        | 19035E35 | 05B37060 | 7FE5E2D4 | FF50C700 | 00AF3900 | 80BE4208 | 00000000 | 9AB7B374 | MPP |
| VSM            |          |          |          |          |          |          |          |          |     |
| IPC RESUME     | 1A035E36 | 00000000 | 00840084 | 00000052 | 00AF3900 | 00000000 | 00000000 | 9AB7B4EF | MPP |
| IPOST(SAP=)    | 1FFE5E37 | 006CFE88 | 80B7E94C | 00167060 | 00000000 | 00000000 | 00000000 | 9AB7B569 | N/A |
| IPC ENQ        | 19155E39 | 00167060 | 40E3D9C1 | FF4B7840 | 00B487C0 | 80BE4394 | 00000000 | 9AB7B5BC | TRA |
| TRA            |          |          |          |          |          |          |          |          |     |
| IPC RESUME     | 1A155E3A | 006CFE88 | 00820082 | 00000082 | 00B487C0 | 00000000 | 00000000 | 9AB7B692 | TRA |
| ISERWAIT       | 23025E3D | 00BA156C | 00E3D9C1 | 80B7E956 | 00000000 | 00000000 | 00000000 | 9AB7B843 | CTL |
| TRA            |          |          |          |          |          |          |          |          |     |
| IECB STORE     | 1B025E3E | 00BA156C | 80B48417 | 00E3D9C1 | 00000000 | 00000000 | 00000000 | 9AB7B88D | CTL |
| SUSPEND        | 27025E40 | 00000000 | 00820082 | 00B48400 | 00000000 | 00000000 | 00000000 | 9AB7B8D7 | CTL |
| XM ISWITCH STK | 10035E44 | 05B4B060 | 80BBE2E8 | 80000002 | 00000001 | 00320032 | 00000000 | 9AB7B90E | MPP |
| TO=XMDLI       |          |          |          |          |          |          |          |          |     |
| RE-DISPATCH    | 05155E45 | 00167060 | 40E3D9C1 | 40000000 | 00000000 | 8015EC84 | 00000000 | 9AB7B9FB | TRA |
| MEM CHANGE     | 11035E46 | 05B4B060 | 00320032 | 00840032 | 00B22E00 | 00000000 | 00000000 | 9AB7BA3B | MPP |
| RE-DISPATCH    | 05035E48 | 05B37060 | 7FE5E2D4 | 00000041 | 00000000 | 8007E9FA | 00000000 | 9AB7BA87 | MPP |
| KPOST LIST     | 2A155E4A | 00167060 | 8015EC36 | 00167064 | 00000000 | 00000000 | 00000000 | 9AB7BACC | TRA |
| IPC ENQ        | 19025E4B | 00BA156C | 40E3D9C1 | FF4B7C00 | 00B48400 | 80BE456E | 00000000 | 9AB7BC79 | CTL |
| TRA            |          |          |          |          |          |          |          |          |     |
| IPC RESUME     | 1A025E4D | 006CEE88 | 00820082 | 00000082 | 00B48400 | 00000000 | 00000000 | 9AB7BE28 | CTL |
| IPOST(ECB=)    | 06035E4F | 05B4B060 | 80B90B8E | 00B21140 | 80B48CD7 | 40C1E6C5 | 00000000 | 9AB7BE86 | MPP |
| AWE            |          |          |          |          |          |          |          |          |     |
| IPC ENQ        | 19015E50 | 00B21140 | 40C1E6C5 | FF4B7340 | 00B48CC0 | 80BE4208 | 00000000 | 9AB7BF72 | LOG |
| AWE            |          |          |          |          |          |          |          |          |     |
| IPC RESUME     | 1A015E51 | 006DEE88 | 00320084 | 00000082 | 00B48CC0 | 00000000 | 00000000 | 9AB7C0CB | LOG |
| IWAIT          | 04155E52 | 00167060 | 00E3D9C1 | 8015EC84 | 00000000 | 00000000 | 00000000 | 9AB7C1E7 | TRA |
| TRA            |          |          |          |          |          |          |          |          |     |
| IECB STORE     | 1B155E54 | 00167060 | 80B487D7 | 00E3D9C1 | 00000000 | 00000000 | 00000000 | 9AB7C324 | TRA |
| SUSPEND        | 27155E55 | 00000000 | 00820082 | 00B487C0 | 00000000 | 00000000 | 00000000 | 9AB7C4B1 | TRA |
| ISERWAIT       | 23035E56 | 85B4B060 | 00000000 | 80B8F602 | 00000000 | 00000000 | 00000000 | 9AB7C661 | MPP |
| IECB STORE     | 1B035E57 | 05B4B060 | 80B22E17 | 00000000 | 00000000 | 00000000 | 00000000 | 9AB7C7AE | MPP |
| SUSPEND        | 27035E58 | 05B4B060 | 00320084 | 00B22E00 | 00000000 | 00000000 | 00000000 | 9AB7C917 | MPP |
| RE-DISPATCH    | 05015E5B | 00B21140 | 40C1E6C5 | 40000000 | 00000000 | 801504A6 | 00000000 | 9AB7CA0E | LOG |
| IWAIT          | 04015E5D | 00B21140 | 00C1E6C5 | 801504A6 | 00000000 | 00000000 | 00000000 | 9AB7CBB5 | LOG |
| AWE            |          |          |          |          |          |          |          |          |     |

## Related reference

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

## ITASK ECB posting

The post exit routine and the IMS posting routine add all ECBs to the posted queue. When an IMS TCB waits for work, IMS issues a z/OS SUSPEND. This task is reactivated by a RESUME invoked by the post exit posting routine or the IMS posting routine.

## System post codes

The subset of the system post codes are listed and described.

### System post codes

The following table lists only a subset of the possible post codes.

Table 266. System post codes

| Code          | Description                                                             |
|---------------|-------------------------------------------------------------------------|
| X'40', C'BTR' | PST posted by scheduler as a result of BMP termination (Subqueues 4, 5) |



Table 266. System post codes (continued)

| Code          | Description                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'40', C'CHK' | PST posted by checkpoint (Subqueues 3, 4, 5, 6)                                                                                                                 |
| X'40', C'SMB' | PST posted by SMB enqueue when a message is received that can be processed by the PST (Subqueue 3 or 6)                                                         |
| X'40', C'CMD' | PST posted by command processor when <b>/START PGM, /START TRAN</b> , or a similar command is entered (Subqueues 3, 6)                                          |
| X'40', C'ABD' | PST posted by DFSCPY00 as a result of an abend in a dependent region (Subqueues 3, 4, 5, 6)                                                                     |
| X'40', C'PRG' | PST posted by scheduler to stop region when checkpoint purge (that is, all messages processed) is complete—this is used if MPP issued last message (Subqueue 3) |
| X'40', C'STP' | PST posted by DFSSTOPO when the region is waiting in scheduler and is to be stopped (Subqueues 3, 4, 5)                                                         |
| X'40', C'DLG' | PST posted by DFSRDLG0 when dynamic log is free (Subqueues 3, 4, 5, 6)                                                                                          |
| X'40', C'CF4' | PST posted by DFSASK00 as a result of an abend in a dependent region (Subqueues 3, 4, 5, 6)                                                                     |
| X'40', C'DEQ' | Terminate control processor ECB posted by DFSRST00 at restart completion                                                                                        |
| X'40', C' TO' | PST posted after ISWITCH to IMS control region TCB                                                                                                              |
| X'40', C'RET' | PST posted after ISWITCH return to dependent region TCB                                                                                                         |

## External subsystem trace

You enable the external subsystem trace by using the **/TRACE SET ON TABLE SUBS** command. When you specify **OPTION LOG**, IMS writes the trace externally as type X'67FA' records.

The External Subsystem (ESS) trace entries help you analyze problems for either:

- A connection problem between the IMS control region and the external subsystem (for example, Db2 for z/OS)
- Any problem between the IMS dependent region and the external subsystem

The following figure illustrates the external subsystem (ESS) trace record format. Each of the sixteen words is 4 bytes long. Words 0 and 1 hold the standard ESS trace record prefix. The Module ID and Sub function (WORD 1) determines what information appears in words 2 through 15.

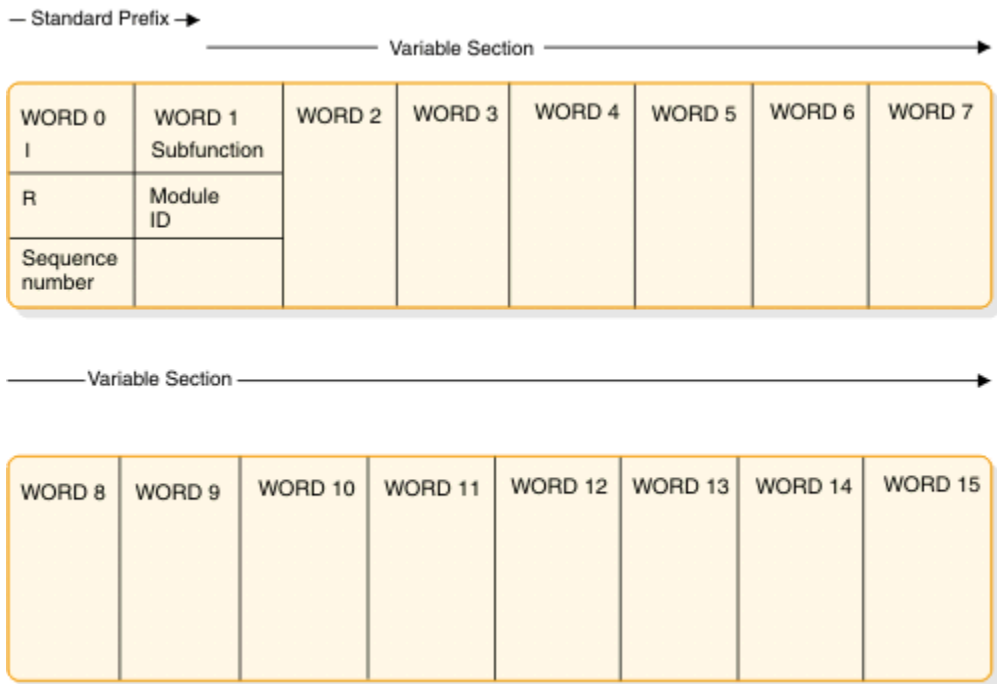


Figure 98. External subsystem (ESS) trace record format

where

**represents**

**I**

This 1-byte field contains the hexadecimal trace record ID. Two possible ID values are X'57' and X'58'. The X'57' record ID is created by a module that executes in the IMS control region (for example, the ESS mother task DFSIESIO). The X'58' record ID is created by a module that executes in an IMS dependent region (for example, DFSECT0).

**R**

This 1-byte field is reserved.

**SEQ NUM**

This 2-byte field contains the hexadecimal trace record sequence number assigned by the IMS trace component.

**MOD ID**

This 2-byte field contains a hexadecimal value that identifies the module that created the trace record. Each ESS module has an associated module ID. Macro DFSESFC contains the complete list of IDs.

**SUB FUNC**

This 2-byte field contains a hexadecimal value that identifies the subfunction that created the trace record within the module. For example, if a module creates a trace record in each of five internal subroutines, each subroutine has a unique SUB FUNC ID.

The following table shows:

- The ID of the module that created the trace record
- The ID of the subfunction (within the module) that created the record
- The name of the module that created the record
- A description of the event being traced

Table 267. Module ID and subfunction table

| Module ID | Subfunction | Module   | Description              |
|-----------|-------------|----------|--------------------------|
| X'0015'   | X'0015'     | DFSESS40 | ESS message service exit |

Table 267. Module ID and subfunction table (continued)

| Module ID | Subfunction                                                                                                                      | Module    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X'0016'   | X'0014'                                                                                                                          | DFSESS30  | ESS logging exit                                                                                                                                                                                                                                                                                                                                                                                                                             |
| X'0017'   | X'0011'<br>X'0012'<br>X'0040'<br>X'0041'                                                                                         | DFSESS10  | IMS control region identify<br>Dependent region identify<br>Control region identify error<br>Identify error subsystem stopped                                                                                                                                                                                                                                                                                                                |
| X'0018'   | X'0013'                                                                                                                          | DFSESS20  | ESS termination exit (if X'57')<br>Dependent region ESS term<br>(if X'58')                                                                                                                                                                                                                                                                                                                                                                   |
| X'0285'   | X'0010'                                                                                                                          | DFSESD80  | Dependent region ESS initialization                                                                                                                                                                                                                                                                                                                                                                                                          |
| X'0288'   | X'0001'                                                                                                                          | DFSESS00  | Dependent region ESS sign on                                                                                                                                                                                                                                                                                                                                                                                                                 |
| X'0289'   | X'0003'                                                                                                                          | DFSESD50  | Dependent region ESS signoff                                                                                                                                                                                                                                                                                                                                                                                                                 |
| X'0290'   | X'0005'                                                                                                                          | DFSESECT0 | Dependent region ESS create thread                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'0291'   | X'0002'<br>X'0003'<br>X'0004'                                                                                                    | DFSESD50  | Dependent region ESS term thread<br>Dependent region ESS term thread<br>region<br>ESS signoff Dependent region ESS<br>term identify                                                                                                                                                                                                                                                                                                          |
| X'0292'   | X'0004'                                                                                                                          | DFSESD50  | Dependent region ESS term identify                                                                                                                                                                                                                                                                                                                                                                                                           |
| X'0293'   | X'0007'                                                                                                                          | DFSESAB0  | Dependent region ESS ABORT                                                                                                                                                                                                                                                                                                                                                                                                                   |
| X'0294'   | X'0008'                                                                                                                          | DFSESP10  | Dependent region ESS commit prep                                                                                                                                                                                                                                                                                                                                                                                                             |
| X'0295'   | X'0009'                                                                                                                          | DFSESP20  | Dependent region ESS commit cont                                                                                                                                                                                                                                                                                                                                                                                                             |
| X'0307'   | X'0016'<br>X'0017'<br>X'0018'                                                                                                    | DFSFESPO  | ESS commit processor entered<br>ESS commit processor exited<br>ESS commit processor R-I-D request                                                                                                                                                                                                                                                                                                                                            |
| X'0402'   | X'0020'<br>X'0021'<br>X'0022'<br>X'0023'<br>X'0024'<br>X'0025'<br>X'0026'<br>X'0027'<br>X'0028'<br>X'0029'<br>X'0030'<br>X'0031' | DFSESI30  | IMS control region daughter identify<br>IMS control region resolve-in-doubt<br>IMS control region ESS CMD<br>IMS control region ESS RRE<br>IMS control region ESS ECHO<br>IMS control region terminate identify<br>IMS control region terminate subsystem<br>IMS control region /STOP CMD<br>IMS control region ESS term record<br>IMS control region ESS shutdown<br>IMS control region ESS termination<br>IMS control region ESS AWE error |
| X'0403'   | X'0019'                                                                                                                          | DFSESI50  | Control region ESS initialization                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 267. Module ID and subfunction table (continued)

| Module ID | Subfunction | Module   | Description                                         |
|-----------|-------------|----------|-----------------------------------------------------|
| X'0404'   | X'0042'     | DFSESI60 | Control region ESS R-I-D exit                       |
| X'0405'   | X'0032'     | DFSESI70 | Control region ESS /CHANGE                          |
| X'0409'   | X'0001'     | DFSIESIO | Mother ITASK request                                |
|           | X'0002'     |          | Control region ESS attach                           |
| X'0506'   | X'0006'     | DFSESPRO | Dependent region ESS program request handler        |
|           | X'0019'     |          | Dependent region ESS program request recursive call |
|           | X'0020'     |          | Dependent region ESS Subsystem                      |
|           |             |          | Not Operational (SNOX)                              |

### Related reference

“IMS type-1 trace function codes” on page 624

You use trace function codes to help you diagnose performance problems or other problems with IMS.

## Layout of the X'57' variable section

The layout of the X'57' variable section is depicted.

### MOD ID = X'0015' SUB FUNC = X'0015' DFSESS40 External SubSys MESSAGE service request record

```

MOD ID   = X'0015'
SUB FUNC = X'0015' DFSESS40 External SubSys MESSAGE service request
              record

      word 2 -- External SubSystem name
      words 3 through 15 not used
    
```

### MOD ID = X'0016' SUB FUNC = X'0014' DFSESS30 External SubSys LOGGING service request record

```

MOD ID   = X'0016'
SUB FUNC = X'0014' DFSESS30 External SubSys LOGGING service request
              record

      word 2 -- External SubSystem name
      words 3 through 15 not used
    
```

### MOD ID = X'0017' SUB FUNC = X'0011' DFSESS10 control region External SubSys IDENTIFY record

```

MOD ID   = X'0017'
SUB FUNC = X'0011' DFSESS10 control region External SubSys IDENTIFY record

      word 2 -- External SubSystem name
      word 3 -- bytes 0-1 not used
              byte 2 GESEGF1 (DFSGESE macro global flag1)
              byte 3 GESEGF2 (DFSGESE macro global flag2)
      word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
              byte 1 not used
              byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
              byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
      word 5 -- bytes 0-1 not used
              bytes 2-3 AWQRC (DFSAWE DFSESI30 identify return code)

      words 6 through 15 not used
    
```

## SUB FUNC = X'0040' DFSESS10 External SubSys GLOBAL identify error record

SUB FUNC = X'0040' DFSESS10 External SubSys GLOBAL identify error record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
      byte 1 not used
      byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
      byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used
```

## SUB FUNC = X'0041' DFSESS10 External SubSys identify with External SubSystem

SUB FUNC = X'0041' DFSESS10 External SubSys identify with External SubSystem

stopped or stopping record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
      byte 1 not used
      byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
      byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used
```

## MOD ID = X'0018' SUB FUNC = X'0013' DFSESS20 External SubSys termination record

MOD ID = X'0018'

SUB FUNC = X'0013' DFSESS20 External SubSys termination record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
      byte 1 not used
      byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
      byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used
```

## MOD ID = X'0402' SUB FUNC = X'0020' DFSESI30 External SubSys IDENTIFY exit record

MOD ID = X'0402'

SUB FUNC = X'0020' DFSESI30 External SubSys IDENTIFY exit record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
      byte 1 ESSTERRC (External SubSys termination reason)
      byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
      byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 15 not used
```

## SUB FUNC = X'0021' DFSESI30 External SubSys RESOLVE IN DOUBT record

SUB FUNC = X'0021' DFSESI30 External SubSys RESOLVE IN DOUBT record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
```

```

        byte 1  ESSTERRC (External SubSys termination reason)
        byte 2  SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3  SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 AWQRC (DFSAWE return code, see DFSESSEC)
words 6 through 7 not used
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

### SUB FUNC = X'0022' DFSESI30 External SubSys /SSR COMMAND exit record

SUB FUNC = X'0022' DFSESI30 External SubSys /SSR COMMAND exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2  GESEGF1 (DFSGESE macro global flag1)
        byte 3  GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0  GESEGF3 (DFSGESE macro global flag3)
        byte 1  ESSTERRC (External SubSys termination reason)
        byte 2  SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3  SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 15 not used

```

### SUB FUNC = X'0023' DFSESI30 External SubSys specific RRE request record

SUB FUNC = X'0023' DFSESI30 External SubSys specific RRE request record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2  GESEGF1 (DFSGESE macro global flag1)
        byte 3  GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0  GESEGF3 (DFSGESE macro global flag3)
        byte 1  ESSTERRC (External SubSys termination reason)
        byte 2  SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3  SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 7 not used
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

### SUB FUNC = X'0024' DFSESI30 External SubSys ECHO exit record

SUB FUNC = X'0024' DFSESI30 External SubSys ECHO exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2  GESEGF1 (DFSGESE macro global flag1)
        byte 3  GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0  GESEGF3 (DFSGESE macro global flag3)
        byte 1  ESSTERRC (External SubSys termination reason)
        byte 2  SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3  SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

### SUB FUNC = X'0025' DFSESI30 External SubSys TERMINATE IDENTIFY exit

SUB FUNC = X'0025' DFSESI30 External SubSys TERMINATE IDENTIFY exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2  GESEGF1 (DFSGESE macro global flag1)

```

```

word 4 -- byte 3 GESEGF2 (DFSGESE macro global flag2)
        byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 15 not used

```

### SUB FUNC = X'0026' DFSESI30 External SubSys TERMINATE SUBSYSTEM record

SUB FUNC = X'0026' DFSESI30 External SubSys TERMINATE SUBSYSTEM record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used

```

### SUB FUNC = X'0027' DFSESI30 External SubSys /STOP command record

SUB FUNC = X'0027' DFSESI30 External SubSys /STOP command record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used

```

### SUB FUNC = X'0028' DFSESI30 External SubSys IMS termination record

SUB FUNC = X'0028' DFSESI30 External SubSys IMS termination record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used

```

### SUB FUNC = X'0029' DFSESI30 External SubSys IMS shutdown record

SUB FUNC = X'0029' DFSESI30 External SubSys IMS shutdown record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used

```

### SUB FUNC = X'0030' DFSESI30 External SubSys TERMINATION exit record

SUB FUNC = X'0030' DFSESI30 External SubSys TERMINATION exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used

```

```

        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 15 not used

```

### SUB FUNC = X'0031' DFSESI30 AWE error record

**SUB FUNC = X'0031'** DFSESI30 AWE error record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 ESSTERRC (External SubSys termination reason)
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 AWQRC (DFSAWE return code)
words 6 through 15 not used

```

### MOD ID = X'0403' SUB FUNC = X'0019' DFSESI50 External SubSys INITIALIZATION exit record

**MOD ID = X'0403'**  
**SUB FUNC = X'0019'** DFSESI50 External SubSys INITIALIZATION exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 not used
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 15 not used

```

### MOD ID = X'0404' SUB FUNC = X'0042' DFSESI60 External SubSys RESOLVE IN DOUBT exit record

**MOD ID = X'0404'**  
**SUB FUNC = X'0042'** DFSESI60 External SubSys RESOLVE IN DOUBT exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 not used
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

### MOD ID = X'0405' SUB FUNC = X'0032' DFSESI70 External SubSys /CHANGE command record

**MOD ID = X'0405'**  
**SUB FUNC = X'0032'** DFSESI70 External SubSys /CHANGE command record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)

```



```

word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 not used
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used

```

### MOD ID = X'0409' SUB FUNC = X'0001' DFSIESI0 mother ITASK request record

```

MOD ID   = X'0409'
SUB FUNC = X'0001' DFSIESI0 mother ITASK request record

word 2 -- not used
word 3 -- bytes 0-1 function requested
        Function requested:
        X'0002' terminate the mother ITASK TCB
        X'0003' build / merge subsystem definitions
        X'0004' SSM JCL parameter
        X'0005' attach external subsystem ITASK TCB
        X'0007' /START command
        X'0008' sync request
        bytes 2-3 not used
word 4 -- not used
word 5 -- bytes 0-1 not used
        bytes 2-3 AWQRC (DFSAWE DFSIESI0 return code)
words 6 through 15 not used

```

### SUB FUNC = X'0002' DFSIESI0 External Subsys ATTACH record

```

SUB FUNC = X'0002' DFSIESI0 External Subsys ATTACH record

word 2 -- External SubSystem name
word 3 -- bytes 0-1 function requested
        Function requested:
        X'0005' attach external subsystem ITASK TCB
        X'0007' /START command
        byte 2 GESEGF1 (DFSGESE macro global flag1)
        byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
        byte 1 not used
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
word 5 -- bytes 0-1 not used
        bytes 2-3 AWQRC (DFSAWE attach process return code)
words 6 through 15 not used

```

## Layout of the X'58' variable section

The layout of the X'58' variable section is depicted.

### MOD ID = X'0015' SUB FUNC = X'0015' DFSESS40 External SubSys MESSAGE service request record

```

MOD ID   = X'0015'
SUB FUNC = X'0015' DFSESS40 External SubSys MESSAGE service request
record

word 2 -- External SubSystem name
words 3 through 15 not used

```

### MOD ID = X'0016' SUB FUNC = X'0014' DFSESS30 External SubSys LOGGING service request record

```

MOD ID   = X'0016'
SUB FUNC = X'0014' DFSESS30 External SubSys LOGGING service request
record

word 2 -- External SubSystem name
words 3 through 15 not used

```

## MOD ID = X'0017' SUB FUNC = X'0011' DFSESS10 control region External SubSys IDENTIFY record

```
MOD ID   = X'0017'  
SUB FUNC = X'0011' DFSESS10 control region External SubSys IDENTIFY record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
        byte 2 GESEGF1 (DFSGESE macro global flag1)  
        byte 3 GESEGF2 (DFSGESE macro global flag2)  
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)  
        byte 1 not used  
        byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)  
        byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)  
word 5 -- bytes 0-1 not used  
        bytes 2-3 AWQRC (DFSAWE DFSESI30 identify return code)  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## SUB FUNC = X'0012' DFSESS10 dependent region External SubSys IDENTIFY record

```
SUB FUNC = X'0012' DFSESS10 dependent region External SubSys IDENTIFY  
record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
        byte 2 EZSGFL (DFSEZS connection status byte1)  
        byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
        byte 1 EZSEFL2 (DFSEZS thread commit status)  
        byte 2 EZSEFL3 (DFSEZS thread termination status)  
        byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
        bytes 2-3 AWQRC (DFSAWE DFSESI30 identify return code)  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## SUB FUNC = X'0040' DFSESS10 IMS detected External SubSys IDENTIFY error record

```
SUB FUNC = X'0040' DFSESS10 IMS detected External SubSys IDENTIFY error  
record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
        byte 2 GESEGF1 (DFSGESE macro global flag1)  
        byte 3 GESEGF2 (DFSGESE macro global flag2)  
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)  
        byte 1 not used  
        byte 2 SSIDFLG1 (SSIDX subsys status flag1)  
        byte 3 SSIDFLG2 (SSIDX subsys status flag2)  
words 5 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## SUB FUNC = X'0041' DFSESS10 IMS detected External SubSys IDENTIFY with External SubSystem stopped or stopping record

```
SUB FUNC = X'0041' DFSESS10 IMS detected External SubSys IDENTIFY with  
External SubSystem stopped or stopping record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
        byte 2 GESEGF1 (DFSGESE macro global flag1)  
        byte 3 GESEGF2 (DFSGESE macro global flag2)  
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)  
        byte 1 not used  
        byte 2 SSIDFLG1 (SSIDX subsys status flag1)  
        byte 3 SSIDFLG2 (SSIDX subsys status flag2)  
words 5 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## MOD ID = X'0018' SUB FUNC = X'0013' DFSESS20 External SubSys termination record

MOD ID = X'0018'  
SUB FUNC = X'0013' DFSESS20 External SubSys termination record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 not used
      byte 2 GESEGF1 (DFSGESE macro global flag1)
      byte 3 GESEGF2 (DFSGESE macro global flag2)
word 4 -- byte 0 GESEGF3 (DFSGESE macro global flag3)
      byte 1 not used
      byte 2 SSIDFLG1 (DFSSSIE subsys status flag1)
      byte 3 SSIDFLG2 (DFSSSIE subsys status flag2)
words 5 through 15 not used
```

## MOD ID = X'0285' SUB FUNC = X'0010' DFSESD80 dep region External SubSys INITIALIZATION exit

MOD ID = X'0285'  
SUB FUNC = X'0010' DFSESD80 dep region External SubSys INITIALIZATION exit  
record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

## MOD ID = X'0288' SUB FUNC = X'0001' DFSESS00 External SubSys SIGNON exit record

MOD ID = X'0288'  
SUB FUNC = X'0001' DFSESS00 External SubSys SIGNON exit record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

## MOD ID = X'0290' SUB FUNC = X'0005' DFSESD50 External SubSys CREATE THREAD exit record

MOD ID = X'0289'  
SUB FUNC = X'0003' DFSESD50 External SubSys SIGNOFF exit record

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

## MOD ID = X'0290' SUB FUNC = X'0005' DFSE SCT0 External SubSys CREATE THREAD exit record

```
MOD ID   = X'0290'  
SUB FUNC = X'0005' DFSE SCT0 External SubSys CREATE THREAD exit record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## MOD ID = X'0291' SUB FUNC = X'0002' DFSESD50 External SubSys TERMINATE THREAD exit record

```
MOD ID   = X'0291'  
SUB FUNC = X'0002' DFSESD50 External SubSys TERMINATE THREAD exit record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## MOD ID = X'0292' SUB FUNC = X'0004' DFSESD50 External SubSys TERMINATE IDENTIFY exit

```
MOD ID   = X'0292'  
SUB FUNC = X'0004' DFSESD50 External SubSys TERMINATE IDENTIFY exit  
record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## MOD ID = X'0293' SUB FUNC = X'0007' DFSESAB0 External SubSys ABORT exit record

```
MOD ID   = X'0293'  
SUB FUNC = X'0007' DFSESAB0 External SubSys ABORT exit record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used
```

```
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

### MOD ID = X'0294' SUB FUNC = X'0008' DFSESP10 External SubSys COMMIT PREPARE exit record

```
MOD ID = X'0294'
SUB FUNC = X'0008' DFSESP10 External SubSys COMMIT PREPARE exit record
```

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

### MOD ID = X'0295' SUB FUNC = X'0009' DFSESP20 External SubSys COMMIT CONTINUE exit record

```
MOD ID = X'0295'
SUB FUNC = X'0009' DFSESP20 External SubSys COMMIT CONTINUE exit record
```

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

### MOD ID = X'0297' SUB FUNC = X'000A' DFSESP30 External SubSys COMMIT VERIFY exit record

```
MOD ID = X'0297'
SUB FUNC = X'000A' DFSESP30 External SubSys COMMIT VERIFY exit record
```

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
      byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- bytes 0-1 not used
      bytes 2-3 External SubSys exit routine return code
words 6 through 7 not used
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)
words 12 through 15 not used
```

### MOD ID = X'0307' SUB FUNC = X'0016' DFSFESP0 External SubSys commit processor entry record

```
MOD ID = X'0307'
SUB FUNC = X'0016' DFSFESP0 External SubSys commit processor entry record
```

```
word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
      byte 2 EZSGFL (DFSEZS connection status byte1)
      byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
      byte 1 EZSEFL2 (DFSEZS thread commit status)
      byte 2 EZSEFL3 (DFSEZS thread termination status)
```

```

word 5 -- byte 3 EZSEFL4 (DFSEZS termination flag)
        byte 0 PSTFUNCT (IDLI function code)
        byte 1 PSTSYNFC (sync function code)
        byte 2 SSTTFGT1 (DFSSSOB termination flag)
        byte 3 not used
word 6 -- bytes 0-1 SSTTCOMP (DFSSSOB user completion bytes 2,3)
        byte 2 LCREF1 (DFSLCRE status indicators)
        byte 3 LCREF2 (DFSLCRE region connection status)
word 7 -- byte 0 LCREF3 (DFSLCRE thread status)
        byte 1 LCREF4 (DFSLCRE internal resource manager status)
        byte 2 LCREESST (DFSLCRE ESS resource manager status byte1)
        byte 3 LCREESF (DFSLCRE ESS resource manager status byte2)
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

## SUB FUNC = X'0017' DFSFESPO External SubSys commit processor exit record

SUB FUNC = X'0017' DFSFESPO External SubSys commit processor exit record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
        byte 2 EZSGFL (DFSEZS connection status byte1)
        byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
        byte 1 EZSEFL2 (DFSEZS thread commit status)
        byte 2 EZSEFL3 (DFSEZS thread termination status)
        byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- byte 0 PSTFUNCT (IDLI function code)
        byte 1 PSTSYNFC (sync function code)
        byte 2 SSTTFGT1 (DFSSSOB termination flag)
        byte 3 not used
word 6 -- bytes 0-1 SSTTCOMP (DFSSSOB user completion bytes 2,3)
        byte 2 LCREF1 (DFSLCRE status indicators)
        byte 3 LCREF2 (DFSLCRE region connection status)
word 7 -- byte 0 LCREF3 (DFSLCRE thread status)
        byte 1 LCREF4 (DFSLCRE internal resource manager status)
        byte 2 LCREESST (DFSLCRE ESS resource manager status byte1)
        byte 3 LCREESF (DFSLCRE ESS resource manager status byte2)
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

## SUB FUNC = X'0018' DFSFESPO External SubSys commit processor Resolve

SUB FUNC = X'0018' DFSFESPO External SubSys commit processor Resolve  
In Doubt requested record

```

word 2 -- External SubSystem name
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)
        byte 2 EZSGFL (DFSEZS connection status byte1)
        byte 3 EZSLFL (DFSEZS connection status byte2)
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)
        byte 1 EZSEFL2 (DFSEZS thread commit status)
        byte 2 EZSEFL3 (DFSEZS thread termination status)
        byte 3 EZSEFL4 (DFSEZS termination flag)
word 5 -- byte 0 PSTFUNCT (IDLI function code)
        byte 1 PSTSYNFC (sync function code)
        byte 2 SSTTFGT1 (DFSSSOB termination flag)
        byte 3 not used
word 6 -- bytes 0-1 SSTTCOMP (DFSSSOB user completion bytes 2,3)
        byte 2 LCREF1 (DFSLCRE status indicators)
        byte 3 LCREF2 (DFSLCRE region connection status)
word 7 -- byte 0 LCREF3 (DFSLCRE thread status)
        byte 1 LCREF4 (DFSLCRE internal resource manager status)
        byte 2 LCREESST (DFSLCRE ESS resource manager status byte1)
        byte 3 LCREESF (DFSLCRE ESS resource manager status byte2)
words 8 through 11 RRETOKEN (DFSRRE UOW recovery token)
word 12 -- bytes 0-1 RRECI (DFSRRE commit indicator)
        bytes 2-3 not used
words 13 through 15 not used

```

## MOD ID = X'0506' SUB FUNC = X'0006' DFSESPRO External SubSys PROGRAM REQUEST HANDLER

```
MOD ID   = X'0506'  
SUB FUNC = X'0006' DFSESPRO External SubSys PROGRAM REQUEST HANDLER  
record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## SUB FUNC = X'0019' DFSESPRO External SubSys PROGRAM REQUEST recursive

```
SUB FUNC = X'0019' DFSESPRO External SubSys PROGRAM REQUEST recursive  
call record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

## SUB FUNC = X'0020' DFSESPRO External SubSys NOT OPERATIONAL (SNOX) exit

```
SUB FUNC = X'0020' DFSESPRO External SubSys NOT OPERATIONAL (SNOX) exit  
record  
  
word 2 -- External SubSystem name  
word 3 -- bytes 0-1 PSTID (IMS dependent region ID)  
       byte 2 EZSGFL (DFSEZS connection status byte1)  
       byte 3 EZSLFL (DFSEZS connection status byte2)  
word 4 -- byte 0 EZSEFL1 (DFSEZS thread startup status)  
       byte 1 EZSEFL2 (DFSEZS thread commit status)  
       byte 2 EZSEFL3 (DFSEZS thread termination status)  
       byte 3 EZSEFL4 (DFSEZS termination flag)  
word 5 -- bytes 0-1 not used  
       bytes 2-3 External SubSys exit routine return code  
words 6 through 7 not used  
words 8 through 11 LCRETOKN (DFSLCRE UOW recovery token)  
words 12 through 15 not used
```

“Type-1 trace table interface” on page 620 shows an example of an external subsystem trace with both X'57' and X'58' record IDs. The ESS trace is called the subsystem (SST) trace in a dump.

### Example of an external subsystem trace (SST)

```
*****  
***TRACE PRINTED FROM OLDEST TO MOST CURRENT ENTRY**  
*****  
FUNCTION          WORD 0          WORD 1          WORD 2          WORD 3          WORD 4          WORD 5          WORD 6          WORD 7  
ESI5 CTL INIT     5700198F      04030019      F1F0F0F1      00000000      00000000      00000000      00000000      00000000  
ESI3 IDENT       570019B8      04020020      F1F0F0F1      00000800      00000000      00000000      00000000      00000000  
ESS4 MESSAGE     570019BD      00150015      F1F0F0F1      00000000      00000000      00000000      00000000      00000000  
ESI3 R-I-D       570019C6      04020021      F1F0F0F1      00002C00      00000000      00000000      00000000      00000000  
ESS3 LOGGING     570019CF      00160014      F1F0F0F1      00000000      00000000      00000000      00000000      00000000  
ESCT CRT THRD    58003165      02900005      F1F0F0F1      0001CC0C      81000000      00000000      00000000      00000000  
FESP SYNC STA    580035D0      03070016      F1F0F0F1      0001CC0C      8C100000      42048000      03F00000      00000000
```

```

ESI3 RRE REQ      570035EC 04020023 F1F0F0F1 00008C00 00000000 00000000 00000000 00000000
ESI3 XS ECHO     570035F1 04020024 F1F0F0F1 00008C00 00000000 00000000 00000000 00000000
ESI3 R-I-D      570035F6 04020021 F1F0F0F1 00008C00 00000000 00000000 00000000 00000000
ESS3 LOGGING    57003608 00160014 F1F0F0F1 00000000 00000000 00000000 00000000 00000000
ESCT CRT THRD   58003A8F 02900005 F1F0F0F1 0001CC0C 81000000 00000000 00000000 00000000
FESP SYNC STA   58003AA1 03070016 F1F0F0F1 0001CC0C 8C100000 01080000 00000000 00000000
ESP1 COM PREP   58003AC8 02940008 F1F0F0F1 0001CC0C 8C500000 00000000 00000000 00000000
FESP SYNC END   58003ACB 03070017 F1F0F0F1 0001CC0C 8CD00000 01080000 00000080 02940000
FESP SYNC STA   58003B1A 03070016 F1F0F0F1 0001CC0C 8CD00000 010C0000 00002080 00000000
ESP2 COM CONT   58003B3D 02950009 F1F0F0F1 0001CC0C 8CD40000 00000000 00000000 00000000
FESP SYNC END   58003B44 03070017 F1F0F0F1 0001CC0C 9CCC0000 010C0000 000020C0 02950000
FESP SYNC STA   58003BA3 03070016 F1F0F0F1 0001CC0C 9CCC0000 42080000 00000000 00000000
FESP SYNC END   58003BA4 03070017 F1F0F0F1 0001CC0C 9CCC0000 42080000 00000080 02950000
FESP SYNC STA   58003BDF 03070016 F1F0F0F1 0001CC0C 9CCC0000 420C0000 00002080 00000000
ESD5 TRM THRD   58003BE7 02910002 F1F0F0F1 0001CC0C 9CCC0000 00000000 00000000 00000000
FESP SYNC END   58003BF1 03070017 F1F0F0F1 0001CC0C 95000C00 420C0000 00002080 00000000

```

```

GOBAL ESET PREFIX
BLOCK AT 00BED480

```

```

PGES 00BED4A4 PLES 00000000 SCDAD 00BEA2B0 PCPE 00000000 ESGL
PICT 00000001 POCT 00000001 00000000

```

```

*** GLOBAL ESET BLOCK ***

```

```

00BED4A4 00000000 0059E9C0 00BED480 F1F0F0F1 40404040 E2E8E2F1 C4E2D5D4 C9D5F1F0
00BED4C4 40404040 40404040 D9F14040 0FC4E2D7 00B4DB40 001547C0 00A0C4C0 80B4DB57
00BED4E4 0FC4E2D7 00B4DB40 00153868 80A0C550 80B4DB57 108021DE 00000022 0059F9C8
00BED504 00000000 00000000 00000000 00000000 00005628 005B85A0 FF412B0C 00000000
00BED524 8C000000 009DC078 0059F998

```

## Resource Recovery Services trace

The Resource Recovery Services trace (RRST) provides information about relevant z/OS Resource Recovery Services (RRS) events in the IMS dependent region. Use the trace under direction of IBM Software Support when problems are suspected in the RRS area.

You enable the Resource Recovery Services trace by using the **/TRACE SET ON TABLE RRST** command. When you specify **OPTION LOG**, IMS writes the trace externally as type X'67FA' records.

### Related concepts

[“Diagnostics for use with synchronous APPC and OTMA with shared queues” on page 354](#)

Synchronous APPC and OTMA message processing in the shared queues environment introduces additional diagnostic considerations for the message flow.

### Related reference

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

### Format of Resource Recovery Services trace records

z/OS Resource Recovery Services trace (RRST) records contain standard fields, and all RRS calls are associated with subfunction codes.

|        |             |                                                                                       |
|--------|-------------|---------------------------------------------------------------------------------------|
| Word 0 | -- byte 1   | One-byte trace ID field. This byte indicates the type of the trace entry.             |
|        | byte 2      | One-byte trace sub function code.                                                     |
|        | byte 3-4    | Two-byte trace sequence number assigned by the IMS trace component.                   |
| Word 1 | -- byte 1   | One-byte numeric Resource Recovery Service call code (see the RRS call table below).  |
|        | byte 2      | One-byte LCREGFLG.                                                                    |
|        | byte 3-4    | Two-byte RRS return code.                                                             |
| Word 2 | -- byte 1-2 | Two-byte PST number - PSTPSTNR.                                                       |
|        | byte 3-4    | Not used.                                                                             |
| Word 3 | -- byte 1-4 | Four-byte LCRERRSF.                                                                   |
| Word 4 | --          | Not used.                                                                             |
| Word 5 | --          | Not used.                                                                             |
| Word 6 | --          | Not used.                                                                             |
| Word 7 | -- byte 1-4 | Bytes 3 through 6 of the system clock (STCK) at the time the trace entry was created. |

The following table shows the RRS calls that are associated with the subfunction codes:



Table 268. Resource Recovery Services calls associated with the subfunction codes

| <b>Subfunction code</b> | <b>Function</b> |
|-------------------------|-----------------|
| X'00'                   | ATRBACK         |
| X'01'                   | ATRCMIT         |
| X'02'                   | ATRDINT         |
| X'03'                   | ATREINT         |
| X'04'                   | ATREINT5        |
| X'05'                   | ATREND          |
| X'06'                   | ATRIBRS         |
| X'07'                   | ATRIERS         |
| X'08'                   | ATRIRLN         |
| X'09'                   | ATRIRNI         |
| X'0A'                   | ATRIRRI         |
| X'0B'                   | ATRISLN         |
| X'0C'                   | ATRPDUE         |
| X'0D'                   | ATRREIC         |
| X'0E'                   | ATRRURD         |
| X'0F'                   | ATRRWID         |
| X'10'                   | ATRSROI         |
| X'11'                   | ATRSIT          |
| X'12'                   | ATRSPID         |
| X'13'                   | ATRSUSI2        |
| X'14'                   | CRGDRM          |
| X'15'                   | CRGGRM          |
| X'16'                   | CRGSEIF         |
| X'17'                   | CRXSEIF         |
| X'18'                   | CTXBEGC         |
| X'19'                   | CTXEINT1        |
| X'1A'                   | CTXDINT         |
| X'1B'                   | CTXENDC         |
| X'1C'                   | CTXSWCH         |
| X'1D'                   | CTXSCID         |
| X'1E'                   | CTXSDTA         |
| X'1F'                   | IEANTCR         |
| X'20'                   | IEANTCT         |

The following table shows the RRS function routines that are associated with the DFSRRSI function routine codes (FRCs).

Table 269. Resource Recovery Services function routines associated with DFSRRSI function routine codes

| Function routine codes | Function routine               |
|------------------------|--------------------------------|
| X'01'                  | Register                       |
| X'02'                  | Restart                        |
| X'03'                  | End_Restart                    |
| X'04'                  | Unregister                     |
| X'05'                  | Switch_Context                 |
| X'06'                  | Determine_Syncpt_Coord         |
| X'07'                  | Initiate_Syncpt                |
| X'08'                  | End_Context                    |
| X'09'                  | Retain_Interest                |
| X'0A'                  | Post_Deferred_UR               |
| X'0B'                  | Disassociate_Context           |
| X'0C'                  | Coordinate_Backout             |
| X'0D'                  | Perform_Syncpt                 |
| X'0E'                  | Identify_Context               |
| X'0F'                  | Post_Deferred_Backout          |
| X'10'                  | Unhook_for_Phase2              |
| X'11'                  | RRS_Validation                 |
| X'12'                  | Delete_UR_Interest             |
| X'13'                  | Retrieve_XID                   |
| X'14'                  | Determine_Batch_Coord          |
| X'15'                  | Create_Context                 |
| X'16'                  | Set_Side_Information           |
| X'17'                  | Create_Cascaded_UR             |
| X'18'                  | Express_UR_Interest            |
| X'19'                  | Commit_UR                      |
| X'1A'                  | Backout_UR                     |
| X'1B'                  | Associate_Context              |
| X'1C'                  | Application_Abend              |
| X'A6'                  | Enter Commit (DFSRRGFS0)       |
| X'A7'                  | Exit Commit (DFSRRGFS0)        |
| X'A8'                  | RRS Error Occurred (DFSRRGFS0) |
| X'A9'                  | RRS Abend Occurred (DFSRRGFS0) |
| X'AA'                  | Token Trace                    |

The following diagrams show the format of the trace records. Each trace record has a trace function code of X'A5' and is X'20' bytes long.

|                  |                                        |
|------------------|----------------------------------------|
| Subfunction Code | = X'00'                                |
| Description      | = Resource Recovery Services - ATRBACK |

|           |                                                  |
|-----------|--------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code |
|           | - byte 2 - LCREGFLG                              |
|           | - byte 3-4 - RRS return code                     |
| Word 2    | - byte 1-2 - PSTPSTNR                            |
|           | - byte 3-4 - Not used                            |
| Word 3    | - LCRERRSF                                       |
| Word 4    | - Not used                                       |
| Words 5-6 | - LCURIDNT                                       |
| Word 7    | - Low 4 byte time stamp (STCK)                   |

|                  |                                        |
|------------------|----------------------------------------|
| Subfunction Code | = X'01'                                |
| Description      | = Resource Recovery Services - ATRCMIT |

|           |                                                  |
|-----------|--------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code |
|           | - byte 2 - LCREGFLG                              |
|           | - byte 3-4 - RRS return code                     |
| Word 2    | - byte 1-2 - PSTPSTNR                            |
|           | - byte 3-4 - Not used                            |
| Word 3    | - LCRERRSF                                       |
| Word 4    | - Not used                                       |
| Words 5-6 | - LCURIDNT                                       |
| Word 7    | - Low 4 byte time stamp (STCK)                   |

|                  |                                        |
|------------------|----------------------------------------|
| Subfunction Code | = X'02'                                |
| Description      | = Resource Recovery Services - ATRDINT |

|           |                                                  |
|-----------|--------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code |
|           | - byte 2 - LCREGFLG                              |
|           | - byte 3-4 - RRS return code                     |
| Word 2    | - byte 1-2 - PSTPSTNR                            |
|           | - byte 3-4 - Not used                            |
| Word 3    | - LCRERRSF                                       |
| Word 4    | - Not used                                       |
| Words 5-6 | - LCURIDNT                                       |
| Word 7    | - Low 4 byte time stamp (STCK)                   |

|                  |                                        |
|------------------|----------------------------------------|
| Subfunction Code | = X'03'                                |
| Description      | = Resource Recovery Services - ATREINT |

|           |                                                  |
|-----------|--------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code |
|           | - byte 2 - LCREGFLG                              |
|           | - byte 3-4 - RRS return code                     |
| Word 2    | - byte 1-2 - PSTPSTNR                            |
|           | - byte 3-4 - Not used                            |
| Word 3    | - LCRERRSF                                       |
| Word 4    | - Not used                                       |
| Words 5-6 | - LCURIDNT                                       |
| Word 7    | - Low 4 byte time stamp (STCK)                   |

|                  |                                         |
|------------------|-----------------------------------------|
| Subfunction Code | = X'04'                                 |
| Description      | = Resource Recovery Services - ATREINT5 |

|           |                                                  |
|-----------|--------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code |
|           | - byte 2 - LCREGFLG                              |
|           | - byte 3-4 - RRS return code                     |
| Word 2    | - byte 1-2 - PSTPSTNR                            |
|           | - byte 3-4 - Not used                            |
| Word 3    | - LCRERRSF                                       |
| Word 4    | - Not used                                       |
| Words 5-6 | - LCURIDNT                                       |
| Word 7    | - Low 4 byte time stamp (STCK)                   |

|                  |                                       |
|------------------|---------------------------------------|
| Subfunction Code | = X'05'                               |
| Description      | = Resource Recovery Services - ATREND |

|        |                                                  |
|--------|--------------------------------------------------|
| Word 1 | - byte 1 - Numeric DFSRRSI function routine code |
|        | - byte 2 - LCREGFLG                              |
|        | - byte 3-4 - RRS return code                     |
| Word 2 | - byte 1-2 - PSTPSTNR                            |
|        | - byte 3-4 - Not used                            |
| Word 3 | - LCRERRSF                                       |
| Word 4 | - Not used                                       |
| Word 5 | - Not used                                       |
| Word 6 | - Not used                                       |
| Word 7 | - Low 4 byte time stamp (STCK)                   |

Subfunction Code = X'06'  
 Description = Resource Recovery Services - ATRIBRS

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'07'  
 Description = Resource Recovery Services - ATRIERIS

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'08'  
 Description = Resource Recovery Services - ATRIRLNL

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'09'  
 Description = Resource Recovery Services - ATRIRINI

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'0A'  
 Description = Resource Recovery Services - ATRIRIRI

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'0B'  
 Description = Resource Recovery Services - ATRISLNL

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

|        |                                                |
|--------|------------------------------------------------|
| Word 2 | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3 | - LCRERRSF                                     |
| Word 4 | - Not used                                     |
| Word 5 | - Not used                                     |
| Word 6 | - Not used                                     |
| Word 7 | - Low 4 byte time stamp (STCK)                 |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'0C'                                                                                                 |
| Description      | = Resource Recovery Services - ATRPDUE                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - byte 1-2 - ATRPDUEEXITNUMBER<br>- byte 3-4 - ATRPDUECOMPLETION                                        |
| Word 5           | - Not used                                                                                              |
| Word 6           | - Not used                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'0D'                                                                                                 |
| Description      | = Resource Recovery Services - ATRREIC                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Words 5-6        | - LCURCNTX                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'0E'                                                                                                 |
| Description      | = Resource Recovery Services - ATRRURD                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Words 5-6        | - IMS_PCTASK_URI_TOKEN                                                                                  |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'0F'                                                                                                 |
| Description      | = Resource Recovery Services - ATRRWID                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Words 5-6        | - URI_Token                                                                                             |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'10'                                                                                                 |
| Description      | = Resource Recovery Services - ATRSROI                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Word 5           | - Not used                                                                                              |
| Word 6           | - URID                                                                                                  |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

Subfunction Code = X'11'  
 Description = Resource Recovery Services - ATRSIT

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'12'  
 Description = Resource Recovery Services - ATRSPID

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 0 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Words 5-6 - IMS\_PCTASK\_URI\_TOKEN  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'13'  
 Description = Resource Recovery Services - ATRSUSI2

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Words 5-6 - IMS\_PCTASK\_RUI\_TOKEN  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'14'  
 Description = RRMS Registration Services - CRGDRM

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'15'  
 Description = RRMS Registration Services - CRGGRM

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

Word 3 - LCRERRSF  
 Word 4 - Not used  
 Word 5 - Not used  
 Word 6 - Not used  
 Word 7 - Low 4 byte time stamp (STCK)

Subfunction Code = X'16'  
 Description = RRMS Registration Services - CRGSEIF

Word 1 - byte 1 - Numeric DFSRRSI function routine code  
 - byte 2 - LCREGFLG  
 - byte 3-4 - RRS return code

Word 2 - byte 1-2 - PSTPSTNR  
 - byte 3-4 - Not used

|        |                                |
|--------|--------------------------------|
| Word 3 | - LCRERRSF                     |
| Word 4 | - Not used                     |
| Word 5 | - Not used                     |
| Word 6 | - Not used                     |
| Word 7 | - Low 4 byte time stamp (STCK) |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'17'                                                                                                 |
| Description      | = RRMS Registration Services - CRXSEIF                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Word 5           | - Not used                                                                                              |
| Word 6           | - Not used                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'18'                                                                                                 |
| Description      | = RRMS Registration Services - CTXBEGC                                                                  |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Words 5-6        | - LCURCNTX                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'19'                                                                                                 |
| Description      | = RRMS Context Services - CTXEINT1                                                                      |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Address(LCRE)                                                                                         |
| Word 5           | - Not used                                                                                              |
| Word 6           | - Not used                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'1A'                                                                                                 |
| Description      | = RRMS Context Services - CTXDINT                                                                       |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Address(IMS_PC_CI-Token)                                                                              |
| Word 5           | - Not used                                                                                              |
| Word 6           | - Not used                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| Subfunction Code | = X'1B'                                                                                                 |
| Description      | = RRMS Context Services - CTXENDC                                                                       |
| Word 1           | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG<br>- byte 3-4 - RRS return code |
| Word 2           | - byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used                                                          |
| Word 3           | - LCRERRSF                                                                                              |
| Word 4           | - Not used                                                                                              |
| Words 5-6        | - LCURCNTX                                                                                              |
| Word 7           | - Low 4 byte time stamp (STCK)                                                                          |

|                  |                                   |
|------------------|-----------------------------------|
| Subfunction Code | = X'1C'                           |
| Description      | = RRMS Context Services - CTXSWCH |

|           |                                                                                |
|-----------|--------------------------------------------------------------------------------|
| Word 1    | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG        |
| Word 2    | - byte 3-4 - RRS return code<br>- byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3    | - LCRERRSF                                                                     |
| Word 4    | - Not used                                                                     |
| Words 5-6 | - LCURCNTX                                                                     |
| Word 7    | - Low 4 byte time stamp (STCK)                                                 |

Subfunction Code = X'1D'  
Description = RRMS Context Services - CTXSCID

|        |                                                                                |
|--------|--------------------------------------------------------------------------------|
| Word 1 | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG        |
| Word 2 | - byte 3-4 - RRS return code<br>- byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3 | - LCRERRSF                                                                     |
| Word 4 | - Address(LCRE)                                                                |
| Word 5 | - Not used                                                                     |
| Word 6 | - Not used                                                                     |
| Word 7 | - Low 4 byte time stamp (STCK)                                                 |

Subfunction Code = X'1E'  
Description = ODBA Set Context Data - CTXSDTA

|        |                                                                                |
|--------|--------------------------------------------------------------------------------|
| Word 1 | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG        |
| Word 2 | - byte 3-4 - RRS return code<br>- byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3 | - LCRERRSF                                                                     |
| Word 4 | - Not used                                                                     |
| Word 5 | - Not used                                                                     |
| Word 6 | - Not used                                                                     |
| Word 7 | - Low 4 byte time stamp (STCK)                                                 |

Subfunction Code = X'1F'  
Description = MVS Name/Token Services - IEANTCR

|        |                                                                                |
|--------|--------------------------------------------------------------------------------|
| Word 1 | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG        |
| Word 2 | - byte 3-4 - RRS return code<br>- byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3 | - LCRERRSF                                                                     |
| Word 4 | - Not used                                                                     |
| Word 5 | - Not used                                                                     |
| Word 6 | - Not used                                                                     |
| Word 7 | - Low 4 byte time stamp (STCK)                                                 |

Subfunction Code = X'20'  
Description = MVS Name/Token Services - IEANTRT

|        |                                                                                |
|--------|--------------------------------------------------------------------------------|
| Word 1 | - byte 1 - Numeric DFSRRSI function routine code<br>- byte 2 - LCREGFLG        |
| Word 2 | - byte 3-4 - RRS return code<br>- byte 1-2 - PSTPSTNR<br>- byte 3-4 - Not used |
| Word 3 | - LCRERRSF                                                                     |
| Word 4 | - Not used                                                                     |
| Word 5 | - Not used                                                                     |
| Word 6 | - Not used                                                                     |
| Word 7 | - Low 4 byte time stamp (STCK)                                                 |

### RRST trace examples

The RRST trace in an OTMA and an APPC environment are depicted. The traces were gathered with tracing volume set to HIGH.

#### RRST trace in an OTMA environment

```
CONTROL CNTL STOPAFT=EOF
*****
* INPUT LOG DATA SET NAME(S): *
```



```

* DARIO. IMS1. OLDSP0. OTMU01. DECKS2
*****
* SELECTION FOR INTERNAL TRACE LOG RECORD(S) *
*
OPTION PRINT O=5,V=67FA,L=2,E=DFSERA60,C=E
1 FUNCTION WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5 WORD 6 WORD 7
PAGE 0001
0* RR1 TRACE TABLE - DATE 2004173 TIME 224754462929 OFFSET 028D SKIP 0000 TOTAL SKIP 00000000 RECORD NUMBER 0000028F
-DFSSLUM0 Exit 7B027F86 01C90000 00000000 00000000 00000000 00000000 00000000 00000000 BB676D0D B53E27A0 SYNCHRONOUS OUTPUT LU
MANAGER
DFSRLM10 Exit 7B0281E8 06400000 C9D4E2F2 40404040 00000000 00000000 00000000 BB676D7A 2B82CF89 RECEIVE LU MANAGER
RECEIVER
DFSSLUM0 Exit 7B0282FD 01C90000 00000000 00000000 00000000 00000000 00000000 BB676DBE 97EF7323 SYNCHRONOUS OUTPUT LU
MANAGER
DFSRLM10 Exit 7B02856E 06400000 C9D4E2F3 40404040 00000000 00000000 00000000 BB676E36 DD321202 RECEIVE LU MANAGER
RECEIVER
DFSRGFS0 (RRS) A0A68972 480005A6 0CB252F8 0CB25060 00010000 00010000 00000000 BB676EB9 17C56A2A ENTER COMMIT
CTXEINT1 (RRS) A5188973 15000000 00010000 00000000 00000000 00000000 00000000 B917C5DD CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A5048974 18000000 00010000 04000000 00000000 00000000 BB676EB9 7E71E000 B917C977 EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A78975 480005A7 0CB252F8 0CB25060 00000001 00000000 00000000 BB676EB9 17ED934A EXIT COMMIT
DFSRGFS0 (RRS) A0AA8976 480005AA 0001E4D9 7E71E000 7E71E000 01000000 0100001E 17ED934A TKN TRACE (A0A7)
DFSYTIB0 (RRS) 5A00897D 28010084 0CB25060 7E71E000 7E71E000 01000000 0100001E B917EEAD INPT MSG ENQUEUED(UR)
TOKEN WORD3-6)
CTXDINT (RRS) A5198C04 05000000 00010000 00000000 0AFBA048 19070000 00000000 BEB54D12 SWITCH_CONTEXT |
NO LCRE FLAGS
ATREINT (RRS) A5038C05 05000000 00010000 40000000 00000000 00000000 BB676EBE 7E71E374 BEB54EDC SWITCH_CONTEXT |
NO LCRE FLAGS
ATTRURD (RRS) A50D8C88 06400000 00010000 60000000 00000000 00000000 BB676EBE B54E530B BF5AF676 DETRMN_SYNC_COORD |
OUTPUT SENT
DFSRGFS0 (RRS) A0A68CF7 480003A6 0CB252F8 0AFF5060 00010000 00010001 BB676EBF 5BACC466 ENTER COMMIT
ATRINT (RRS) A5028CF8 12000000 00010000 20000000 00000000 00000000 00000000 BF5BAD3B DELETE_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A78CF9 480003A7 0CB252F8 0AFF5060 00000001 00000000 00000000 BB676EBF 5BB19926 EXIT COMMIT
DFSRGFS0 (RRS) A0AA8CFA 480003AA 0001C3E7 BB676EB9 17C86FAA 01000000 022A4060 5BB19926 TKN TRACE (A0A7)
DFSRGFS0 (RRS) A0A68D0A 480001A6 0CB252F8 0AFF5060 00010000 00010002 BB676EBF 5BB30B2E ENTER COMMIT
CTXSCID (RRS) A51C8D0B 19000000 00010000 00000000 00000000 00000000 BB676EB9 17C86FAA BF5BB31D COMMIT_UR |
NO LCRE FLAGS
ATRCMIT (RRS) A5018D0C 19000000 00010000 00080000 00000000 00000000 00000000 BF5BB422 COMMIT_UR |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A78D0D 480001A7 0CB252F8 0AFF5060 00000001 00000000 00000000 BB676EBF 5BFA1C26 EXIT COMMIT
DFSRGFS0 (RRS) A0AA8D0E 480001AA 0001C3E7 BB676EB9 17C86FAA 01000000 022A4060 5BFA1C26 TKN TRACE (A0A7)
ATRDINT (RRS) A5028D5E 08400000 00010000 62002001 00000000 00000000 BB676EBE 7E71E374 BF5C4396 END_CONTEXT |
OUTPUT SENT
CTXENDC (RRS) A51A8D5F 08400000 00010000 62002001 00000000 00000000 BB676EBE B54E9F6B BF5C4602 END_CONTEXT |
OUTPUT SENT
DFSRGFS0 (RRS) A0A68F9F 480005A6 0CB252F8 0CB25060 00010000 00010003 BB676ED7 2204448D ENTER COMMIT
CTXEINT1 (RRS) A5188FA0 15000000 00010000 00000000 00000000 00000000 00000000 D72204AF CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A5048FA1 18000000 00010000 04000000 00000000 00000000 BB676ED7 7E71E000 D72206A2 EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A78FA2 480005A7 0CB252F8 0CB25060 00000001 00000000 00000000 BB676ED7 220DB20D EXIT COMMIT
DFSRGFS0 (RRS) A0AA8FA3 480005AA 0001E4D9 7E71E000 7E71E000 01000002 0100001E 220DB20D TKN TRACE (A0A7)
DFSYTIB0 (RRS) 5A008FAA 28010084 0CB25060 7E71E000 7E71E000 01000002 0100001E D7223231 INPT MSG ENQUEUED(UR)
TOKEN WORD3-6)
DFSAOSW0 (RRS) 7B0890AB 47000000 0B27C060 40C1D6E2 0CB252F8 00000000 00000000 BB676ED8 D8D3326F APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B0290AC 02400000 00000000 0CB25060 00000000 00000000 00000000 BB676ED8 D8D3630F DFSAPPC MSG SWITCH
PROCESSOR
DFSSLUM0 Exit 7B0290AD 01800000 00000002 00000000 00000000 00000000 00000000 BB676ED8 D8DD6EAF SYNCHRONOUS OUTPUT LU
MANAGER
DFSYTIB0 (RRS) 5A0090B5 2802A084 0CB25060 7E71E000 7E71E000 01000002 0100001E D8D8E13F BE RESPONSE RECVD(UR)
TOKEN WORD3-6)
DFSYLUS0 (RRS) 5A0091F1 2A060002 0CB25060 7E71E000 7E71E000 01000002 0100001E D8F4361F OTMA SERVICE:UNK FUNC
DFSRGFS0 (RRS) A0A691FA 480001A6 0CB252F8 0CB25060 00020000 00010000 BB676ED8 F4376B81 ENTER COMMIT
CTXSCID (RRS) A51C91FB 19000000 00020000 00000000 00000000 00000000 BB676ED7 22060A4D D8F437D0 COMMIT_UR |
NO LCRE FLAGS
ATRCMIT (RRS) A50191FC 19000000 00020000 00080000 00000000 00000000 00000000 D8F439BA COMMIT_UR |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A791FD 480001A7 0CB252F8 0CB25060 00000001 00000000 00000000 BB676ED8 FC093A68 EXIT COMMIT
DFSRGFS0 (RRS) A0AA91FE 480001AA 0002E4D9 7E71E000 7E71E000 01000002 0100001E FC093A68 TKN TRACE (A0A7)
DFSRGFS0 (RRS) A0A69401 480005A6 0CB252F8 0CB25060 00010000 00010004 BB676EFE B7210502 ENTER COMMIT
CTXEINT1 (RRS) A5189402 15000000 00010000 00000000 00000000 00000000 00000000 FEB72191 CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A5049403 18000000 00010000 04000000 00000000 00000000 BB676EFE 7E71E000 FEB7242F EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A79404 480005A7 0CB252F8 0CB25060 00000001 00000000 00000000 BB676EFE B72C3502 EXIT COMMIT
DFSRGFS0 (RRS) A0AA9405 480005AA 0001E4D9 7E71E000 7E71E000 01000004 0100001E B72C3502 TKN TRACE (A0A7)
DFSYTIB0 (RRS) 5A00940C 28010084 0CB25060 7E71E000 7E71E000 01000004 0100001E FEB7314C INPT MSG ENQUEUED(UR)
TOKEN WORD3-6)
DFSAOSW0 (RRS) 7B0895E1 47000000 0B27C060 40C1D6E2 0CB252F8 00000000 00000000 BB676F0A 3B00B4A3 APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B0295E2 02400000 00000000 0CB25060 00000000 00000000 00000000 BB676F0A 3B00E323 DFSAPPC MSG SWITCH
PROCESSOR
DFSSLUM0 Exit 7B0295E3 01800000 00000003 00000000 00000000 00000000 00000000 BB676F0A 3B0ABC23 SYNCHRONOUS OUTPUT LU
MANAGER
DFSYTIB0 (RRS) 5A0095EB 2802A084 0CB25060 7E71E000 7E71E000 01000004 0100001E 0A3B0E44 BE RESPONSE RECVD(UR)
TOKEN WORD3-6)
DFSYLUS0 (RRS) 5A0096BC 2A060002 0CB25060 7E71E000 7E71E000 01000004 0100001E 0A7AD931 OTMA SERVICE:UNK FUNC
DFSRGFS0 (RRS) A0A696C5 480001A6 0CB252F8 0CB25060 00020000 00010000 BB676F0A 7ADED120 ENTER COMMIT
1 FUNCTION WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5 WORD 6 WORD 7

```

```

7
-CTXSCID (RRS) A51C96C6 19000000 00020000 00000000 00000000 BB676EFE B7236902 0A7ADF43 COMMIT_UR |
NO LCRE FLAGS
ATRCMIT (RRS) A50196C7 19000000 00020000 00080000 00000000 00000000 00000000 0A7AE4B4 COMMIT_UR |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A79739 480001A7 0CB252F8 0CB25060 00000001 00000000 BB676F0A D26D5C0E EXIT COMMIT
DFSRGFS0 (RRS) A0AA973A 480001AA 0002E4D9 7E71E000 7E71E000 01000004 0100001E D26D5C0E TKN TRACE (A0A7)
DFSRGFS0 (RRS) A0A69881 480005A6 0CB252F8 0CB25060 00010000 00010005 BB676F22 71395349 ENTER COMMIT
CTXEINT1 (RRS) A5189882 15000000 00010000 00000000 00000000 00000000 00000000 227139DC CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A5049883 18000000 00010000 04000000 00000000 BB676F22 7E71E000 22713C07 EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A79884 480005A7 0CB252F8 0CB25060 00000001 00000000 BB676F22 71439009 EXIT COMMIT
DFSRGFS0 (RRS) A0AA9885 480005AA 0001E4D9 7E71E000 7E71E000 01000006 0100001E 71439009 TKN TRACE (A0A7)
DFSYTIB0 (RRS) 5A00988C 28010080 0CB25060 7E71E000 7E71E000 01000006 0100001E 22714D7A INPT MSG ENQUEUED(UR)
TOKEN WORD3-6)
DFAOSW0 (RRS) 7B08999C 47000000 0B27C060 40C1D6E2 0CB252F8 00000000 BB676F22 F5CA6326 APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B02999D 02400000 00000000 0CB25060 00000000 00000000 BB676F22 F5CA8E46 DFSAPPC MSG SWITCH
PROCESSOR
DFSSLUM0 Exit 7B02999E 01800000 00000004 00000000 00000000 00000000 BB676F22 F5D4A386 SYNCHRONOUS OUTPUT LU
MANAGER
DFSYTIB0 (RRS) 5A0099A6 2802C080 0CB25060 7E71E000 7E71E000 01000006 0100001E 22F5D812 BE RESPONSE RECVD(UR)
TOKEN WORD3-6)
DFSYLUS0 (RRS) 5A0099B9 2A060002 0CB25060 7E71E000 7E71E000 01000006 0100001E 22F5DEAF OTMA SERVICE:UNK FUNC
DFSRGFS0 (RRS) A0A699C5 480001A6 0CB252F8 0CB25060 00030000 00010000 BB676F22 F5F4C026 ENTER COMMIT
CTXSCID (RRS) A51C99C6 19000000 00030000 00000000 00000000 BB676F22 713B6A69 22F5F53D COMMIT_UR |
NO LCRE FLAGS
ATRCMIT (RRS) A50199C7 19000000 00030000 00080000 00000000 00000000 00000000 22F5F72B COMMIT_UR |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A799CA 480001A7 0CB252F8 0CB25060 00000001 00000000 BB676F22 FBFA8107 EXIT COMMIT
DFSRGFS0 (RRS) A0AA99CB 480001AA 0003E4D9 7E71E000 7E71E000 01000006 0100001E FBFA8107 TKN TRACE (A0A7)
DFSRGFS0 (RRS) A0A69C13 480005A6 0CB252F8 0CB25060 00010000 00010006 BB676F52 B618084F ENTER COMMIT
CTXEINT1 (RRS) A5189C14 15000000 00010000 00000000 00000000 00000000 00000000 52B6187C CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A5049C15 18000000 00010000 04000000 00000000 BB676F52 7E71E000 52B61B58 EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A79C16 480005A7 0CB252F8 0CB25060 00000001 00000000 BB676F52 B6230D2F EXIT COMMIT
DFSRGFS0 (RRS) A0AA9C17 480005AA 0001E4D9 7E71E000 7E71E000 01000008 0100001E B6230D2F TKN TRACE (A0A7)
DFSYTIB0 (RRS) 5A009C1E 28010084 0CB25060 7E71E000 7E71E000 01000008 0100001E 52B62C94 INPT MSG ENQUEUED(UR)
TOKEN WORD3-6)
DFAOSW0 (RRS) 7B089E2A 47000000 0B27C060 40C1D6E2 0CB252F8 00000000 BB676F5C AB73B56C APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B029E2B 02400000 00000000 0CB25060 00000000 00000000 BB676F5C AB73E68C DFSAPPC MSG SWITCH
PROCESSOR
DFSSLUM0 Exit 7B029E2C 01800000 00000005 00000000 00000000 00000000 BB676F5C AB7BB62C SYNCHRONOUS OUTPUT LU
MANAGER
DFSYTIB0 (RRS) 5A009E34 2802A084 0CB25060 7E71E000 7E71E000 01000008 0100001E 5CAB7F1D BE RESPONSE RECVD(UR)
TOKEN WORD3-6)
DFSYLUS0 (RRS) 5A009F94 2A060002 0CB25060 7E71E000 7E71E000 01000008 0100001E 5CD77072 OTMA SERVICE:UNK FUNC
DFSRGFS0 (RRS) A0A69F9D 480001A6 0CB252F8 0CB25060 00020000 00010000 BB676F5C D771B08A ENTER COMMIT
CTXSCID (RRS) A51C9F9E 19000000 00020000 00000000 00000000 BB676F52 B61A728F 5CD7720F COMMIT_UR |
NO LCRE FLAGS
ATRCMIT (RRS) A5019F9F 19000000 00020000 00080000 00000000 00000000 00000000 5CD773D6 COMMIT_UR |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A79FA0 480001A7 0CB252F8 0CB25060 00000001 00000000 BB676F5D 26DB750C EXIT COMMIT
DFSRGFS0 (RRS) A0AA9FA1 480001AA 0002E4D9 7E71E000 7E71E000 01000008 0100001E 26DB750C TKN TRACE (A0A7)
DFS707I END OF FILE ON INPUT
DFS708I OPTION COMPLETE
DFS703I END OF JOB

```

### RRST trace in an APPC environment

```

CONTROL CNTL STOPAFT=EOF
*****
* INPUT LOG DATA SET NAME(S): *
* DARIO.IMS1.OLDSP0.ASQA01.DECKS2
*****
* SELECTION FOR INTERNAL TRACE LOG RECORD(S) *
*
OPTION PRINT 0=5,V=67FA,L=2,E=DFSERA60,C=E
1 FUNCTION WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5 WORD 6 WORD
7
0* RR1 TRACE TABLE - DATE 2004173 TIME 232543999620 OFFSET 028D SKIP 0000 TOTAL SKIP 00000000 RECORD NUMBER 0000025E
-DFSSLUM0 Exit 7B027EE0 01C90000 00000000 00000000 00000000 00000000 BB677710 C2AEA808 SYNCHRONOUS OUTPUT LU
MANAGER
DFSRM10 Exit 7B028133 06400000 C9D4E2F2 40404040 00000000 00000000 BB677781 0AE6512D RECEIVE LU MANAGER
RECEIVER
DFSRGFS0 (RRS) A0A684E2 480005A6 0CB25998 0CB25700 00010000 00010000 BB6777BB CE2AFD09 ENTER COMMIT
CTXEINT1 (RRS) A51884E3 15000000 00010000 00000000 00000000 00000000 00000000 BBCE2B81 CREATE_CONTEXT |
NO LCRE FLAGS
ATREINT5 (RRS) A50484E4 18000000 00010000 04000000 00000000 BB6777BB 7E71E000 BBCE2F49 EXPRESS_UR_INTRST |
NO LCRE FLAGS
DFSRGFS0 (RRS) A0A784E5 480005A7 0CB25998 0CB25700 00000001 00000000 BB6777BB D2E7E905 EXIT COMMIT
DFSRGFS0 (RRS) A0AA84E6 480005AA 0001E4D9 7E71E000 7E71E000 01000000 0100001E D2E7E905 TKN TRACE (A0A7)
DFSRM10 (RRS) 7B0084ED 06000000 0CB25700 7E71E000 7E71E000 01000000 0100001E 00000000 RECEIVE LU MANAGER
RECEIVER
DFAOSW0 (RRS) 7B0885AB 47000000 0BB80060 40C1D6E2 0CB25998 00000000 BB6777BD 4A2DBA20 APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B0285AC 02400000 00000000 0CB25700 00000000 00000000 BB6777BD 4A2DEE60 DFSAPPC MSG SWITCH

```



```

DFSRGFS0 (RRS) A0A78D69 480005A7 0CB25998 0CB25700 00000001 00000000 BB6777D7 0ABC5A28 EXIT COMMIT
DFSRGFS0 (RRS) A0AA8D6A 480005AA 0001E4D9 7E71E000 7E71E000 01000008 0100001E 0ABC5A28 TKN TRACE (A0A7)
DFSRM10 (RRS) 7B008D71 06000000 0CB25700 7E71E000 7E71E000 01000008 0100001E 00000000 RECEIVE LU MANAGER
RECEIVER
DFSAOSW0 (RRS) 7B088EE9 47000000 0BB80060 40C1D6E2 0CB25998 00000000 BB6777D7 A738EA6F APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B028EEA 02400000 00000000 0CB25700 00000000 00000000 BB6777D7 A739192F DFSAPPC MSG SWITCH
PROCESSOR
DFS6LUS0 Exit 7B028EEB 01800000 00000006 00000000 00000000 00000000 BB6777D7 A744892F SYNCHRONOUS OUTPUT LU
MANAGER
DFS6LUS0 (RRS) 7B098F1D 0A000001 0CB25700 7E71E000 7E71E000 01000008 0100001E 00000000 LU62 SERVICES
INTERFACE 1
DFSRGFS0 (RRS) A0A68F26 480001A6 0CB25998 0CB25700 00020000 00010000 BB6777D7 A7D2356F ENTER COMMIT
CTXSCID (RRS) A51C8F27 19000000 00020000 00000000 00000000 BB6777D7 0AB3A848 D7A7D2B2 COMMIT_UR |
NO LCRE FLAGs
ATRCMIT (RRS) A5018F28 19000000 00020000 00080000 00000000 00000000 00000000 D7A7D4D7 COMMIT_UR |
NO LCRE FLAGs
DFSRGFS0 (RRS) A0A78F29 480001A7 0CB25998 0CB25700 00000001 00000000 BB6777D7 B160BD29 EXIT COMMIT
DFSRGFS0 (RRS) A0AA8F2A 480001AA 0002E4D9 7E71E000 7E71E000 01000008 0100001E B160BD29 TKN TRACE (A0A7)
CTXDINT (RRS) A5198FD5 0E000000 00000000 00000000 0C1833D8 19070000 00000000 DD59F8EF IDENTIFY_CONTEXT |
NO LCRE FLAGs
DFSRGFS0 (RRS) A0A6901F 480004A6 0CB25998 0CB25700 00010000 00010005 BB6777DD 5B634549 ENTER COMMIT
ATREINT5 (RRS) A5049020 18000000 00010000 04000000 00000000 BB6777DD 7E71E374 DD5B63AD EXPRESS_UR_INTRST |
NO LCRE FLAGs
DFSRGFS0 (RRS) A0A79021 480004A7 0CB25998 0CB25700 00000001 00000000 BB6777DD 5B699BA9 EXIT COMMIT
DFSRGFS0 (RRS) A0AA9022 480004AA 0001E4D9 7E71E374 7E71E374 01000002 0100001E 5B699BA9 TKN TRACE (A0A7)
DFSRM10 (RRS) 7B009029 06000000 0CB25700 7E71E374 7E71E374 01000002 0100001E 00000000 RECEIVE LU MANAGER
RECEIVER
DFSAOSW0 (RRS) 7B0891A1 47000000 0BB80060 40C1D6E2 0CB25998 00000000 BB6777DD E519D12A APPC/OTMA SMQ AWE
server
DFSAPPC0 Exit 7B0291A2 02400000 00000000 0CB25700 00000000 00000000 BB6777DD E519FD2A DFSAPPC MSG SWITCH
PROCESSOR
DFS6LUS0 Exit 7B0291A3 01800000 00000007 00000000 00000000 00000000 BB6777DD E5241B2A SYNCHRONOUS OUTPUT LU
MANAGER
DFS6LUS0 (RRS) 7B0991E8 0A000001 0CB25700 7E71E374 7E71E374 01000002 0100001E 00000000 LU62 SERVICES
INTERFACE 1
DFSRGFS0 (RRS) A0A691F1 480001A6 0CB25998 0CB25700 00050000 00010000 BB6777DD E935F58C ENTER COMMIT
CTXSCID (RRS) A51C91F2 19000000 00050000 00000000 00000000 BB6777DD 591A1C0A DDE93669 COMMIT_UR |
NO LCRE FLAGs
ATRCMIT (RRS) A50191F3 19000000 00050000 00080000 00000000 00000000 00000000 DDE93885 COMMIT_UR |
NO LCRE FLAGs
DFSRGFS0 (RRS) A0A79272 480001A7 0CB25998 0CB25700 00000001 00000000 BB6777DD FC906981 EXIT COMMIT
DFSRGFS0 (RRS) A0AA9273 480001AA 0005E4D9 7E71E374 7E71E374 01000002 0100001E FC906981 TKN TRACE (A0A7)
CTXSWCH (RRS) A51B9299 08000000 00000000 00002000 00000000 BB6777DD 591A1C0A DE02A604 END_CONTEXT |
NO LCRE FLAGs
DFS707I END OF FILE ON INPUT
DFS708I OPTION COMPLETE
DFS703I END OF JOB

```

### RRST entries for OTMA modules

The formats of OTMA trace entries for z/OS Resource Recovery Services related events are shown in the following diagrams.

#### TRACE ID = X'5A00'

```

TRACE ID = X'5A00'
Word 1          - byte 0 - 2A, module number for DFSYLUS0
                - byte 1 - 01, OTMA GU was invoked
                - byte 2 - DLAFLAG1
                - byte 3 - DLAFLAG4
Word 2          - Back-end YTIB CLB address
Words 3-6      - RRS parent UR token
Word 7          - Time stamp (short)

```

#### TRACE ID = X'5A00'

```

TRACE ID = X'5A00'
Word 1          - byte 0 - 2A, module number for DFSYLUS0
                - byte 1 - 02, Fastpaht GU was invoked
                - byte 2 - DLAFLAG1
                - byte 3 - DLAFLAG4
Word 2          - Front-end IMS YTIB CNT address
Words 3-6      - RRS parent UR token
Word 7          - Time stamp (short)

```

#### TRACE ID = X'5A00'

```

TRACE ID = X'5A00'
Word 1          - byte 0 - 2A, module number for DFSYLUS0
                - byte 1 - 03, Back-end IMS issued a DFS2224 message
                - byte 2 - DLAFLAG1
                - byte 3 - DLAFLAG4

```

|           |                                                                         |
|-----------|-------------------------------------------------------------------------|
| Word 2    | - Front-end IMS YTIB CLB address (CNT address for fastpath transaction) |
| Words 3-6 | - RRS parent UR token                                                   |
| Word 7    | - Time stamp (short)                                                    |

**TRACE ID = X'5A00'**

|                    |                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                                               |
| Word 1             | - byte 0 - 2D, module number for DFSYSLM0<br>- byte 1 - 01, back-end XCF send succeed<br>- byte 2 - AOS_FLAGS<br>- byte 3 - 0 |
| Word 2             | - Back-end YTIB address                                                                                                       |
| Words 3-6          | - RRS parent UR token                                                                                                         |
| Word 7             | - Time stamp (short)                                                                                                          |

**TRACE ID = X'5A00'**

|                    |                                                                                                                              |
|--------------------|------------------------------------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                                              |
| Word 1             | - byte 0 - 2D, module number for DFSYSLM0<br>- byte 1 - 02, back-end XCF send failed<br>- byte 2 - AOS_FLAGS<br>- byte 3 - 0 |
| Word 2             | - Back-end YTIB address                                                                                                      |
| Words 3-6          | - RRS parent UR token                                                                                                        |
| Word 7             | - Time stamp (short)                                                                                                         |

**TRACE ID = X'5A00'**

|                    |                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                                                |
| Word 1             | - byte 0 - 25, module number for DFSYPSI0<br>- byte 1 - 01, OTMA Protected Trans was submitted<br>- byte 2 - 0<br>- byte 3 - 0 |
| Word 2             | - Front-end YTIB CLB address                                                                                                   |
| Words 3-6          | - Context token                                                                                                                |
| Word 7             | - Time stamp (short)                                                                                                           |

**TRACE ID = X'5A00'**

|                    |                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                                                                |
| Word 1             | - byte 0 - 28, module number for DFSYTIB0<br>- byte 1 - 01, OTMA input message is about to enqueue<br>- byte 2 - 0<br>- byte 3 - YTIB_MSG_TYPE |
| Word 2             | - Front-end YTIB CLB address                                                                                                                   |
| Words 3-6          | - RRS parent UR token                                                                                                                          |
| Word 7             | - Time stamp (short)                                                                                                                           |

**TRACE ID = X'5A00'**

|                    |                                                                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                                                                            |
| Word 1             | - byte 0 - 28, module number for DFSYTIB0<br>- byte 1 - 02, response from back-end is received<br>- byte 2 - YTIB_MSG_STATUS_3<br>- byte 3 - YTIB_MSG_TYPE |
| Word 2             | - Front-end YTIB CLB address                                                                                                                               |
| Words 3-6          | - RRS parent UR token                                                                                                                                      |
| Word 7             | - Time stamp (short)                                                                                                                                       |

**z/OS Resource Recovery Services entries logged by OTMA modules**

RRS entries logged by OTMA modules are depicted.

**TRACE ID = X'5A00'**

|                    |                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------|
| TRACE ID = X'5A00' |                                                                                                 |
| Word 1             | - byte 0 - 2A, module number for DFSYLUS0<br>- byte 1 - 06, XCF_good_Send or - 05, XCF_bad_Send |
| Word 2             | - A(ECB)                                                                                        |
| Words 3-6          | - LUP_UR_TOKEN (AWRRURTK)                                                                       |
| Word 7             | - Time stamp (short)                                                                            |

## Trace entries logged by z/OS Resource Recovery Services related modules

Trace entry records for DFSRGSF0 and TOKEN Tracing are depicted.

### TRACE ID = X'A0A6' DFSRGSF0 Entry record

```
TRACE ID = X'A0A6' DFSRGSF0 Entry record
Word 1      - byte 0 - 72, module number for DFSRGSF0
             - bytes 1-2 - Function, SEE AWRRFUNC
             - byte 3 - A6 Module entry
Word 2      - A(TIB)
Word 3      - A(ECB) - from AWRRECB
Word 4      - bytes 0-2 - PST number
Word 5      - Number of queued AWEs
Word 7      - Time stamp (STCK)
```

### TRACE ID = X'A0A7' DFSRGSF0 Exit record

```
TRACE ID = X'A0A7' DFSRGSF0 Exit record
Word 1      - byte 0 - 72, module number for DFSRGSF0
             - bytes 1-2 - Function, SEE AWRRFUNC
             - byte 3 - A7 Module exit
Word 2      - A(TIB)
Word 3      - A(ECB) - from AWRRECB
Word 4      - bytes 0-1 - Highest number of AWEs
             - bytes 2-3 - Number greater of AWEs than TCBS
Word 5      - Trace return code (AWRRETCD)
Word 7      - Time stamp (STCK)
```

```
TRACE ID = X'A0A8' DFSRGSF0 Error Occurred
```

```
TRACE ID = X'A0A9' DFSRGSF0 ABEND Occurred
```

### TRACE ID = X'A0AA' TOKEN Tracing record

```
TRACE ID = X'A0AA' TOKEN Tracing record
Word 1      - byte 0 - 72, module number for DFSRGSF0
             - bytes 1-2 - Function, SEE AWRRFUNC
             - byte 3 - AA - Token trace record
Word 2      - bytes 0-1 - PST Number
             - bytes 2-3 - Token id (CX=Context,IN=Interest,
                          UR=Unit of recovery)
Words 4-7   - TOKEN
```

## Scheduler trace

When you use the **/TRACE SET ON TABLE SCHD** command, IMS enables the scheduler trace. When you specify **OPTION LOG**, IMS sends these entries to the log as type **X'67FA'** records.

### Scheduler trace record formats

The following code samples show the formats of the scheduler trace records for function codes **X'41'** through **X'48'**.

#### Scheduler trace record format for function code **X'41'**

```
TRACE ID = X'41'
word 0 - byte 1 - X'41' Scheduling starts, traced by DFSSBMP0
        byte 2 - PST number
        bytes 3-4 - Trace sequence number
word 1 - SCHD must be addressable by caller
word 2 - Reserved
word 3 - SAPCNTRL
words 4-5 - Reserved
word 6 - Module identifier
word 7 - Store clock value
```

### Scheduler trace record format for function code X'42'

```
TRACE ID = X'42'  
word 0 - byte 1 - X'42' Block mover, traced by DFSSBMP0,  
          DFSSBMP0, DFSSMSC0  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 - byte 1 - PDIRCODE  
          byte 2 - PDIROPTC  
          byte 3 - PSTSCHDF  
          byte 4 - PSTCODE1  
word 2 - PSTPSB  
word 3 - PSTSMB  
words 4-5 - Reserved  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'43'

```
TRACE ID = X'43'  
word 0 - byte 1 - X'43' Scheduling ends  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 - PSTABTRM  
word 2 - PSTPSB  
word 3 - SAPCNTRL  
words 4-5 - Reserved  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'44'

```
TRACE ID = X'44'  
word 0 - byte 1 - X'44' IRC started  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 - SSIMCOMP  
word 2 - Reserved  
word 3 - SAPCNTRL  
words 4-5 - Reserved  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'45'

```
TRACE ID = X'45'  
word 0 - byte 1 - X'45' TMS00 started  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 - A(PST)  
word 2 - Sync point function code (COMMIT/P1/P2/BACKOUT)  
word 3 - Caller of TMS00  
word 4 - TPI (first four bytes)  
word 5 - TPI (last four bytes)  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'46'

```
TRACE ID = X'46'  
word 0 - byte 1 - X'46' TMS00 finished  
          byte 2 - PST number  
          bytes 3-4 - Trace sequence number  
word 1 - A(PST)  
word 2 - Sync point function code (COMMIT/P1/P2/BACKOUT)  
word 3 - Return code  
word 4 - TPI (first four bytes)  
word 5 - TPI (last four bytes)  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'47'

```
TRACE ID = X'47'  
word 0 - byte 1 - X'47' APPC extract call made  
         byte 2 - PST number  
         bytes 3-4 - Trace sequence number  
word 1 - Function code (FPRETRY/PUSER)  
word 2 - Abend code (PSTABTRM)  
word 3 - Return code from DFSTMR00  
word 4 - Return code from APPC extract call  
word 5 - Reserved  
word 6 - Module identifier  
word 7 - Store clock value
```

### Scheduler trace record format for function code X'48'

```
TRACE ID = X'48'  
word 0 - byte 1 - X'48' Scheduling failed  
         byte 2 - PST number  
         bytes 3-4 - Trace sequence number  
word 1 - byte 1 - PDIRCODE  
         byte 2 - PDIROPTC  
         byte 3 - PSTSCHDF  
         byte 4 - PSTCODE1  
word 2 - PSTPSB  
word 3 - PSTSMB  
words 4-5 - Reserved  
word 6 - Module identifier  
word 7 - Store clock value
```

### Example of a scheduler trace

```
*****  
***TRACE PRINTED FROM OLDEST TO MOST CURRENT ENTRY**  
*****  
FUNCTION          WORD 0      WORD 1      WORD 2      WORD 3  
                  WORD 4      WORD 5      WORD 6      WORD 7  
BLOCK MOVER       4207E98A  44060000  16F90598  00800041  
                  00000000  00000000  00000000  F89569D5  
SCHED END         4307E994  00000000  16F90598  00800001  
                  00000000  00000000  00000000  F8956BD3  
SCHED START       4156F4D0  E2C3C8C4  16920060  00800001  
                  00000000  00000000  00000000  F89973E5  
BLOCK MOVER       4256F4DE  44060000  170305E8  00800041  
                  00000000  00000000  00000000  F89979DA  
SCHED END         4356F4E8  00000000  170305E8  00800001  
                  00000000  00000000  00000000  F8997B43  
IRC START         44560737  00000000  00000000  00800001  
                  00000000  00000000  16CAF7A0  F8A95716  
IRC START         4407077F  00000000  00000000  00800001  
                  00000000  00000000  16CAF7A0  F8A9CA44  
SCHED START       4107078C  E2C3C8C4  15AB5060  00800001  
                  00000000  00000000  00000000  F8A9D45F  
BLOCK MOVER       4207079A  44060000  16F90598  00800041  
                  00000000  00000000  00000000  F8A9DF19  
SCHED END         430707A4  00000000  16F90598  00800001  
                  00000000  00000000  00000000  F8A9E0C4  
SCHED START       417007B5  E2C3C8C4  15A48060  00800001  
                  00000000  00000000  00000000  F8AA4B87  
BLOCK MOVER       42700804  44060000  16F91740  00800041  
                  00000000  00000000  00000000  F8AB0631  
SCHED END         4370080E  00000000  16F91740  00800001  
                  00000000  00000000  00000000  F8AB07C2  
IRC START         447008CE  00000000  00000000  00800001  
                  00000000  00000000  16CAF7A0  F8ABC593  
SCHED START       417008DB  E2C3C8C4  15A48060  00800001  
                  00000000  00000000  00000000  F8ABDC0  
BLOCK MOVER       427008E9  44060000  16F91740  00800041  
                  00000000  00000000  00000000  F8ABD209  
SCHED END         437008F3  00000000  16F91740  00800001
```

### Related reference

[“IMS type-1 trace function codes” on page 624](#)



You use trace function codes to help you diagnose performance problems or other problems with IMS.

## Storage manager trace

The storage manager trace writes a record each time it is called to allocate a pool, get a buffer, or release a buffer. The storage manager traces requests from the following pools: AOIP, CESS, CIOP, CMDP, DYNP, EMHB, FPWP, HIOP, LUMC, LUMP, and SPAP.

You can enable the storage manager trace during IMS initialization with the STRG= option in the DFSVSMxx PROCLIB member, or online using the **/TRACE** command. The **/TRACE SET ON TABLE STRG** command activates the trace and sends the output to an internal trace table. When you specify OPTION LOG on the **/TRACE** command, IMS sends the output to the system log or external trace data set.

You can format the internal trace table using the Offline Dump Formatter under IPCS with either the **VERBX** command or the IMS Dump Formatter panels. To format the trace records, any storage manager control blocks, and pool storage, you can specify ALL as the POOL ID, as shown in the following example.

```
FMTIMS ...(POOL,NAME,ALL),...or you can specify FMTIMS (TRACE, NAME, SM).
```

To locate the storage manager trace in a formatted dump, look for eye catcher \*\*SMTR.

To locate the trace tables in an unformatted dump, look for the trace identifier SM in the trace table header record.

The following tables show the format of each storage manager trace record.

Table 270. TRACE ID = X'5F03' (get trace record)

| WORD 0              | WORD 1    | WORD 2             | WORD 3                                       | WORD 4 | WORD 5                  | WORD 6      | WORD 7 |
|---------------------|-----------|--------------------|----------------------------------------------|--------|-------------------------|-------------|--------|
| Control Information | Pool Name | Variable Pool Size | Variable Pool Address Fixed Pool Upper Limit | 0      | Caller's Return Address | Return Code | 0      |

Table 271. TRACE ID = X'5F04' (get trace record)

| WORD 0              | WORD 1    | WORD 2              | WORD 3         | WORD 4                  | WORD 5                  | WORD 6      | WORD 7            |
|---------------------|-----------|---------------------|----------------|-------------------------|-------------------------|-------------|-------------------|
| Control Information | Pool Name | Buffer Request Size | Buffer Address | Address of Caller's ECB | Caller's Return Address | Return Code | Current Pool Size |

Table 272. TRACE ID = X'5F05' (release trace record)

| WORD 0              | WORD 1    | WORD 2 | WORD 3         | WORD 4                  | WORD 5                  | WORD 6      | WORD 7            |
|---------------------|-----------|--------|----------------|-------------------------|-------------------------|-------------|-------------------|
| Control Information | Pool Name | 0      | Buffer Address | Address of Caller's ECB | Caller's Return Address | Return Code | Current Pool Size |

### Related concepts

[“Formatting IMS dumps offline” on page 560](#)

Two methods are available for formatting IMS dumps offline: interactive formatting, performed through a series of panels which provide formatting choices, and formatting by using JCL.

### Related reference

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

## Latch trace

When you use the **/TRACE SET ON TABLE LATCH** command, IMS traces events related to its internal serialization services (latch manager, use manager, and system locate control function) to an internal table.

The following table shows the general format of a latch trace entry.

Table 273. Format of a latch trace entry

| WORD 0 |   |            | WORD 1        | WORD 2 | WORD 3 | WORD 4 | WORD 5 | WORD 6 | WORD 7 |
|--------|---|------------|---------------|--------|--------|--------|--------|--------|--------|
| I      | S | SEQ<br>NUM | ENTRY<br>TYPE |        |        |        |        |        |        |

where:

### I

One-byte trace ID field. This byte indicates the type of the trace entry. It is always X'70' for latch trace entries.

### S

One-byte trace subtype field. This field is used for latch manager trace entries to denote the latch function being traced. It is not currently used for Use Manager trace entries.

### SEQ NUM

Two-byte trace sequence number assigned by the IMS trace component.

### ENTRY TYPE

For Use Manager trace entries only: 4-byte printable character string, indicating the type of entry.

Words 2 through 6 contain data specific to each trace entry.

### Related reference

“IMS type-1 trace function codes” on page 624

You use trace function codes to help you diagnose performance problems or other problems with IMS.

### Latch manager trace entries

The sub functions GET, GETU, REL, and RCOV are listed.

#### Sub Function: X'01' Get latch (GET)

```
Sub Function: X'01' Get latch (GET)
Description:  Get a latch
word 1 -- Caller's SAP address
word 2 -- Latch name
word 3 -- Caller's return address
word 4 -- Resource header address
word 5 -- 1st halfword = latch level;
          2nd halfword = flags from latch manager parmlist
word 6/7 -- 8-byte STCK value
```

#### Sub Function: X'02' - Upgrade latch (GETU)

```
Sub Function: X'02' - Upgrade latch (GETU)
Description:  Upgrade a latch from shared to exclusive
word 1 -- Caller's SAP address
word 2 -- Latch name
word 3 -- Caller's return address
word 4 -- Resource header address
word 5 -- 1st halfword = latch level;
          2nd halfword = flags from latch manager parmlist
word 6/7 -- 8-byte STCK value
```

### **Sub Function: X'03' - Release latch (REL)**

```
Sub Function: X'03' - Release latch (REL)
Description: Release a latch
word 1 -- Caller's SAP address
word 2 -- Latch name
word 3 -- Caller's return address
word 4 -- Resource header address
word 5 -- 1st halfword = latch level;
          2nd halfword = flags from latch manager parmlist
word 6/7 -- 8-byte STCK value
```

### **Sub Function: X'04' - Recover latch (RCOV)**

```
Sub Function: X'04' - Recover latch (RCOV)
Description: Recover a latch
word 1 -- SAP, TCB, or ASCB address
word 2 -- Latch name
word 3 -- Caller's return address
word 4 -- 0
word 5 -- 1st halfword = latch level;
          2nd halfword = flags from latch manager parmlist
word 6/7 -- 8-byte STCK value
```

### **Use manager trace entries**

Eleven entry types are listed and described.

#### **Entry Type: USE**

```
Entry Type: USE
Description: Inuse request trace entry
word 1 -- 'USE'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

#### **Entry Type: LOK**

```
Entry Type: LOK
Description: Lock request trace entry
word 1 -- 'LOK'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

#### **Entry Type: CON**

```
Entry Type: CON
Description: Connect request trace entry
word 1 -- 'CON'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

#### **Entry Type: MRG**

```
Entry Type: MRG
Description: Merge request trace entry
```

```
word 1 -- 'MRG'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: INQ

Entry Type: INQ  
Description: Inquiry request trace entry

```
word 1 -- 'INQ'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: NUSE

Entry Type: NUSE  
Description: Nouse request trace entry

```
word 1 -- 'NUSE'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: NLOK

Entry Type: NLOK  
Description: Unlock request trace entry

```
word 1 -- 'NLOK'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: NCON

Entry Type: NCON  
Description: Disconnect request trace entry

```
word 1 -- 'NCON'
word 2 -- Block type
word 3 -- Call ID
word 4 -- Work ID
word 5 -- Block address
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: RCOV (SAP level)

Entry Type: RCOV (SAP level)  
Description: Use recovery performed at the SAP (ITASK) level trace entry

```
word 1 -- 'RCOV'
word 2 -- 'SAP'
word 3 -- Block Type
word 4 -- SAP address
word 5 -- Ø
```

```
word 6 -- 0
word 7 -- Caller's return address
```

### Entry Type: RCOV (TCB level)

```
Entry Type: RCOV (TCB level)
Description: Use recovery performed at the TCB level trace entry
word 1 -- 'RCOV'
word 2 -- 'TCB'
word 3 -- Block Type
word 4 -- 0
word 5 -- TCB address
word 6 -- 0
word 7 -- Caller's return address
```

### Entry Type: RCOV (address space level)

```
Entry Type: RCOV (address space level)
Description: Use recovery performed at the address space level trace entry
word 1 -- 'RCOV'
word 2 -- 'MEM'
word 3 -- Block Type
word 4 -- 0
word 5 -- ASCB address
word 6 -- 0
word 7 -- Caller's return address
```

### System locate control function entries

Entry types for SLC0, SLC1, and a latch trace example are depicted.

### Entry Type: SLC0

```
Entry Type: SLC0
Description: Locate a block and issue a use manager inuse call against it
word 1 -- 'SLC0'
word 2 -- Block Type
word 3 -- Work ID
word 4 -- Call ID
word 5 -- ''
word 6 -- SAP address
word 7 -- Caller's return address
```

### Entry Type: SLC1

```
Entry Type: SLC1
Description: Locate a block and issue a use manager nouse call against it
word 1 -- 'SLC1'
word 2 -- Block Type
word 3 -- Work ID
word 4 -- Call ID
word 5 -- ''
word 6 -- SAP address
word 7 -- Caller's return address
```

### Latch trace example

```
**LTR                                LATCH TRACE
*****
***TRACE PRINTED FROM OLDEST TO MOST CURRENT ENTRY**
*****
FUNCTION      WORD 0      WORD 1      WORD 2      WORD 3      WORD 4      WORD 5      WORD 6      WORD 7
COMMON LATCH  70006A98  GET        QMGR        SHR        00005F28  00290000  065975F0  8004BABA
COMMON LATCH  70006A99  REL        QMGR        ANY        00005F28  00290000  065975F0  800EAA62
COMMON LATCH  70006A9A  GET        QMGR        SHR        00005F28  00290000  065975F0  8004BABA
COMMON LATCH  70006A9B  REL        QMGR        ANY        00005F28  00290000  065975F0  800EAA62
COMMON LATCH  70006A9C  GET        DCSL        SHR        05B581B0  00030000  065975F0  8004F2C4
COMMON LATCH  70006A9E  GET        LOGL        EXCL       05B58F70  002F0000  065975F0  85B0EED4
COMMON LATCH  70006A9F  REL        LOGL        EXCL       05B58F70  002F0000  065975F0  85B0E53C
COMMON LATCH  70006AA1  GET        QMGR        SHR        00005F28  00290000  065975F0  8004BABA
COMMON LATCH  70006AA2  REL        QMGR        ANY        00005F28  00290000  065975F0  800EAA62
```

|              |          |      |      |      |          |          |          |          |
|--------------|----------|------|------|------|----------|----------|----------|----------|
| COMMON LATCH | 70006AA3 | REL  | DCSL | SHR  | 05B581B0 | 00030000 | 065975F0 | 80046012 |
| COMMON LATCH | 70006AA4 | NUSE | ALLW | .... | 05F66060 | 00000000 | 065975F0 | 06D2CCC2 |
| COMMON LATCH | 70006AA6 | GET  | LOGL | EXCL | 05B58F70 | 002F0000 | 065975F0 | 85B0EED4 |
| COMMON LATCH | 70006AA7 | REL  | LOGL | EXCL | 05B58F70 | 002F0000 | 065975F0 | 85B0E53C |
| COMMON LATCH | 70006AAD | GET  | LOGL | EXCL | 05B58F70 | 002F0000 | 065975F0 | 85B0EED4 |
| COMMON LATCH | 70006AB2 | REL  | LOGL | EXCL | 05B58F70 | 002F0000 | 065975F0 | 85B0E53C |
| COMMON LATCH | 70006AB4 | GET  | TCTB | EXCL | 05B71858 | 00130000 | 065975F0 | 85B5CB3A |
| COMMON LATCH | 70006AB5 | REL  | TCTB | EXCL | 05B71858 | 00130000 | 065975F0 | 85B5CD78 |
| COMMON LATCH | 70006AB6 | GET  | SMGT | EXCL | 05C47288 | 002B0000 | 065975F0 | 85B0BAEA |
| COMMON LATCH | 70006AB7 | REL  | SMGT | EXCL | 05C47288 | 002B0000 | 065975F0 | 85B0BBB6 |
| COMMON LATCH | 70006AB8 | GET  | PDRB | EXCL | 05BA9E90 | 00150000 | 065975F0 | 85B5AB26 |
| COMMON LATCH | 70006AB9 | GET  | PSBP | SHR  | 05B587A0 | 00160000 | 065975F0 | 85B5ABE6 |
| COMMON LATCH | 70006ABA | REL  | PDRB | EXCL | 05BA9E90 | 00150000 | 065975F0 | 85B5AED4 |
| COMMON LATCH | 70006ABB | REL  | PSBP | ANY  | 05B587A0 | 00160000 | 065975F0 | 85B5AF90 |
| COMMON LATCH | 70006ABC | GET  | SUBQ | SHR  | 05B71418 | 00200000 | 065975F0 | 85B4291E |
| COMMON LATCH | 70006ABD | REL  | SUBQ | SHR  | 05B71418 | 00200000 | 065975F0 | 85B42A60 |
| COMMON LATCH | 70006ABE | GET  | SUBQ | SHR  | 05B71430 | 00200000 | 065975F0 | 85B4291E |
| COMMON LATCH | 70006ABF | REL  | SUBQ | SHR  | 05B71430 | 00200000 | 065975F0 | 85B42A60 |
| COMMON LATCH | 70006AC7 | GET  | QMGR | SHR  | 00005F28 | 00290000 | 06597790 | 8004BABE |
| COMMON LATCH | 70006AC8 | REL  | QMGR | ANY  | 00005F28 | 00290000 | 06597790 | 800EAA62 |
| COMMON LATCH | 70006ACA | SLC0 | LNBO | .. - | C4D3C1F3 | 40404040 | 06597790 | 05B7BD2A |
| COMMON LATCH | 70006ACB | GET  | VLQB | SHR  | 00BD2230 | 00260000 | 06597790 | 800511A4 |
| COMMON LATCH | 70016ACC | USE  | CNT  | DLA3 | 05FB4060 | 07926568 | 06597790 | 05B312AE |
| COMMON LATCH | 70006ACD | REL  | VLQB | ANY  | 00BD2230 | 00260000 | 06597790 | 800511A4 |
| COMMON LATCH | 70006ACE | REL  | SCHD | ANY  | 05B58660 | 00120000 | 06597790 | 85B60CB4 |

## Queue manager trace

The queue manager trace provides information about relevant queue manager functional and exceptional events. Use the trace under the direction of IBM support personnel when problems are suspected in the queue manager area.

### Turning on the queue manager trace

You can turn on the queue manager trace in two ways:

- During IMS online initialization with the QMGR parameter in the DFSVSMxx IMS.PROCLIB member.
- During online operation, with the **/TRACE** command.

You can specify trace output destination and tracing volume on both the QMGR parameter and the **/TRACE** command.

If you send output to the common trace table, you can format the table using the Offline Dump Formatter under IPCS, using either the **VERBX** command or the IMS Dump Formatter panels. If you send the output to an external data set, you can use the File Select and Formatting Print utility (DFSERA10) with exit routine DFSERA60 to format the trace entries.

To locate the queue manager trace in a formatted dump, look for eye catcher **\*\*QMGR**. To locate the trace table in an unformatted dump, look for the trace identifier **QM** in the trace table header record.

### Related reference

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

### Format of trace records

The following diagrams show the format of the trace records. Each trace record has a trace function code of X'4E' and is X'20' bytes long.

#### Subfunction codes

**SC**

**FUNCTION**

**X'00'**

GET PREFIX

**X'01'**

CANCEL INPUT

**X'02'**  
GET UNIQUE

**X'03'**  
GET NEXT

**X'04'**  
DEQUEUE

**X'05'**  
SAVE

**X'06'**  
REJECT

**X'07'**  
DELETE

**X'08'**  
CANCEL OUTPUT (LOG)

**X'09'**  
CANCEL OUTPUT (NOLOG)

**X'0C'**  
ENQUEUE (FIFO)

**X'0D'**  
ENQUEUE (LIFO)

**X'0E'**  
REENQUEUE (FIFO)

**X'0F'**  
REENQUEUE (LIFO)

**X'10'**  
REPOSITION

**X'11'**  
AOI COMMAND INPUT

**X'12'**  
AOI MESSAGE TO MASTER

**X'13'**  
AOI CANCEL UEHB

**X'14'**  
AOI TERMINATION

**X'17'**  
UNUSED OP CODE

**X'18'**  
UNUSED OP CODE

**X'19'**  
UNUSED OP CODE

**X'1A'**  
INSERT PREFIX

**X'1C'**  
CONDITIONAL ENQUEUE (FIFO)

**X'1D'**  
CONDITIONAL ENQUEUE (LIFO)

**X'1E'**  
TRANSFER

**X'1F'**  
NOTE/POINT

## Low level trace record format

**FUNCTION: See above listing**  
Subfunction Code: See above listing

```
word 0 -- Control information
word 1 -- A(ECB)
word 2 -- A(QTPPCB)
word 3 -- byte 1 - Current call type
           byte 2 - Prior call type
           byte 3 - (unused)
           byte 4 - (unused)
word 4 -- Caller's ID (WORD 1)
word 5 -- Caller's ID (WORD 2)
word 6 -- Unused (zero)
word 7 -- Time stamp
```

## Medium level trace record format - X'21'

“Medium level trace record format - X'21'” on page 682 depicts the trace (medium level) record format of the following function with subfunction code X'21':

**FUNCTION: EXIT FROM QUEUE MANAGER**  
Subfunction Code: X'21'

```
word 0 -- Control information
word 1 -- PCB Contents (WORD 1)
word 2 -- A(QTPPCB)
word 3 -- Return code
word 4 -- PCB contents (WORD 4)
word 5 -- PCB contents (WORD 5)
word 6 -- PCB contents (WORD 6)
word 7 -- Time stamp
```

## Medium level trace record format - X'20''

“Medium level trace record format - X'20'” on page 682 depicts the trace (medium level) record format of the following function with subfunction code X'20':

**FUNCTION: ENTRY TO QUEUE MANAGER**  
Subfunction Code: X'20'

```
word 0 -- Control information
word 1 -- PCB Contents (WORD 1)
word 2 -- A(QTPPCB)
word 3 -- PCB contents (WORD 3)
word 4 -- PCB contents (WORD 4)
word 5 -- PCB contents (WORD 5)
word 6 -- PCB contents (WORD 6)
word 7 -- Time stamp
```

## Medium level trace record format - X'22'

This figure depicts the trace (medium level) record format of the following function with subfunction code X'22':

**FUNCTION: Special- Not Applicable**  
Subfunction Code: X'22'

```
word 0 -- Control information
word 1 -- Varies by use
word 2 -- Varies by use
word 3 -- Varies by use
word 4 -- Varies by use
word 5 -- Varies by use
word 6 -- Varies by use
word 7 -- Time stamp
```



## Low level trace record format - X'08', X'15', X'1B'

“Low level trace record format - X'08', X'15', X'1B'” on page 683 depicts the trace (low level) record format of the following functions with these subfunction codes (SC):

### SC

#### FUNCTION

X'08'

X'15'

MESSAGE REROUTE

X'1B'

INSERT MOVE SPANNABLE

**FUNCTION:** See above list  
**Subfunction Code:** See above list

```
word 0 -- Control information
word 1 -- A(ECB)
word 2 -- A(QTPPCB)
word 3 -- byte 1 - Current call type
           byte 2 - Prior call type
           byte 3 - (unused)
           byte 4 - (unused)
word 4 -- Caller's ID (WORD 1)
word 5 -- Caller's ID (WORD 2)
word 6 -- byte 1 - Length of user segment
           byte 2 - Length of user segment
           byte 3 - (unused)
           byte 4 - (unused)
word 7 -- Time stamp
```

## Low level trace record format - X'0A'

“Low level trace record format - X'0A'” on page 683 depicts the trace (low level) record format of the following function with subfunction code X'0A':

**FUNCTION:** INSERT LOCATE  
**Subfunction Code:** X'0A'

```
word 0 -- Control information
word 1 -- A(ECB)
word 2 -- A(QTPPCB)
word 3 -- byte 1 - Current call type
           byte 2 - Prior call type
           byte 3 - (unused)
           byte 4 - (unused)
word 4 -- Caller's ID (WORD 4)
word 5 -- Caller's ID (WORD 2)
word 6 -- Length of requested message area
word 7 -- Time stamp
```

## Low level trace record format - X'16'

“Low level trace record format - X'16'” on page 683 depicts the trace (low level) record format of the following function with subfunction code X'16':

**FUNCTION:** RELEASE  
**Subfunction Code:** X'16'

```
word 0 -- Control information
word 1 -- A(ECB)
word 2 -- A(QTPPCB)
word 3 -- byte 1 - Current call type
           byte 2 - Prior call type
           byte 3 - (unused)
           byte 4 - (unused)
word 4 -- Caller's ID (WORD 1)
word 5 -- Caller's ID (WORD 2)
word 6 -- Contents of DECAREA
word 7 -- Time stamp
```

## Shared queues interface trace

The shared queues interface trace provides information about errors associated with the interface between IMS and CQS.

Examples of errors that are traced are:

- CQS Request errors
- CQS Inform errors
- Service errors
- Storage errors

Use this trace under the direction of IBM Software Support when problems are suspected in the interface between IMS and CQS.

You can turn on the shared queues interface trace in two ways:

- During IMS online initialization, with the SQTТ parameter in the DFSVSMxx IMS.PROCLIB member.
- During online operation, with the **/TRACE** command.

Each trace entry is X'20' bytes long.

You can specify trace output destination and tracing volume on both the SQTТ parameter and the **/TRACE** command.

The **/TRACE SET ON TABLE SQTТ** command activates the trace and sends the output to an internal trace table that consists of 126 entries. If you specify OPTION LOG on the **/TRACE** command, IMS sends the output to the system log or an external trace data set in groups of 126. Other parameters control the volume of output.

You can format trace table entries with the Offline Dump Formatter under IPСS, using either the VERBX parameter or the IMS Dump Formatter panels. You can use the File Select and Formatting Print utility (DFSERA10) with exit routine DFSERA60 to format the trace entries written to an external data set.

To locate the shared queues interface trace in a dump, look for eye catcher \*\*SQTТ.

To display the status of the trace, use the **/DISPLAY TRACE** command.

### Related reference

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

## Fast Path trace

When you use the **/TRACE SET ON TABLE FPTT** command, IMS enables the Fast Path trace. The Fast Path trace resides in the internal IMS trace tables, with the OPTION LOG parameter causing the trace to also be written to the IMS logs.

If the OPTION LOG parameter is not specified (or the OPTION NOLOG parameter is specified), the trace resides only in the IMS internal trace tables and is formatted through the IMS Dump Formatter. If the OPTION LOG parameter is specified, the trace will also reside on the logs and can be formatted with DFSERA60 for log type X'67FA' or through the IMS Dump Formatter.

### Trace formats

Fast Path reserves X'9C' and X'9D' trace entries. X'9C' is reserved for tracing notifies and X'9D' is reserved for all other Fast Path traces.

#### X'9C' trace format

The following table shows the format of the X'9C' trace entry. Following the table are the trace IDs and descriptions of content of trace entry.

Table 274. Format of the Fast Path X'9C' trace entry

| Word 0   | Word 1   | Word 2   | Word 3   | Word 4   | Word 5   | Word 6   | Word 7   |
|----------|----------|----------|----------|----------|----------|----------|----------|
| aabbcccc | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd |

**Trace ID**

**Description of Content of Trace Entry**

**aa**

The FP Notify trace code, X'9C'

**bb**

The trace subcode, used so that each IMSFP trace entry has a unique code or subcode, avoiding duplication of the same trace function.

**X'01'**

DBFNOTM0 Entry

**X'02'**

NCB contents at entry to DBFNOTM0

**X'03'**

DBFNOTM0 NOTEXC (DFSLM->IRLM)

**X'04'**

DBFNOTM0 IWAIT

**X'05'**

DBFNOTM0 after IWAIT

**X'06'**

DBFICLI0 Entry

**X'07'**

NCB contents at entry to DBFICLI0

**X'08'**

DBFICLI0 Response decrement EPSTNCTR

**X'09'**

DBFICLI0 IPOST

**X'0A'**

DBFCSTS2 EPST Timeout Candidate

**X'0B'**

DBFCSTS2 EPST Timeout IPOST

**cccc**

The Trace Sequence Number

**dddddddd**

Data, specific for each trace entry.

**X'9D' trace format**

The following table shows the format of the X'9D' trace entry. Following the table are the trace IDs and descriptions of content of trace entry.

Table 275. Format of the Fast Path X'9D' trace entry

| Word 0   | Word 1   | Word 2   | Word 3   | Word 4   | Word 5   | Word 6   | Word 7   |
|----------|----------|----------|----------|----------|----------|----------|----------|
| aabbcccc | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd | dddddddd |

**Trace ID**

**Description of Content of Trace Entry**

**aa**

The FP General trace code, X'9D'

**bb**

The FP latch trace subcodes

**X'01'**

DBFELOCK DMAC

**X'02'**

DBFELOCK DMCB

**X'03'**

DBFELOCK DSM

**X'04'**

DBFELOCK FLD

**X'05'**

DBFELOCK FNCB

**X'06'**

DBFELOCK MSDB

**X'07'**

DBFELOCK TRAT

**X'08'**

DBFELOCK VSO

**X'09'**

DBFELOCK VSTR

**X'0A'**

DBFELOCK XCRB

**X'10'**

Resource Latch

**X'11'**

DBFSYNL Latch

**X'12'**

DBFBUFL Latch

**X'13'**

DBFEMHBL Latch

**X'14'**

DBFLATCH Latch

**X'15'**

DBFALOCK Latch

**X'16'**

DBFHLOCK Latch

**X'17'**

DBFPLOCK Latch

**cccc**

The Trace Sequence Number

**dddddddd**

Data, specific for each trace entry

**Related reference**

[“IMS type-1 trace function codes” on page 624](#)

You use trace function codes to help you diagnose performance problems or other problems with IMS.

## Fast Path trace entries

Fast Path trace entries are listed, including Trace ID, Module name, and Trace point.

### Trace entries for Fast Path

The following table describes the Fast Path trace entries.

*Table 276. Fast Path trace entries*

| Trace ID | Module   | Trace point                       | Comments                     |
|----------|----------|-----------------------------------|------------------------------|
| ALOC     | DBFALOC0 | Entry                             | FP trace data set allocation |
| ALOX     | DBFALOC0 | Exit                              | FP trace data set allocation |
| RTYE     | DBFALOC0 | EMHB Present                      | FP trace data set allocation |
| RTYS     | DBFALOC0 | No EMHB Present                   | FP trace data set allocation |
| ALOP     | DBFALOC0 | Trace data set already allocated  | FP trace data set allocation |
| BBIN     | DBFBBIN0 | Entry, Exit (Shift)               | MSDB Binary Search           |
| OFSE     | DBFBBIN0 | Binary Search                     | MSDB Binary Search           |
| BIN1     | DBFBBIN0 | Binary Search Entry, Exit (Shift) | MSDB Binary Search           |
| BCHG     | DBFBCHG0 | Entry                             | MSDB FLD Call Change         |
| RCHG     | DBFBCHG0 | Exit                              | MSDB FLD Call Change         |
| BOFL     | DBFBCHG0 | Overflow                          | MSDB FLD Call Change         |
| BCL0     | DBFBCL10 | Entry                             | MSDB Call Handler            |
| RCL0     | DBFBCL10 | Exit                              | MSDB Call Handler            |
| IRC2     | DBFBCL10 | Copy Call Data                    | MSDB Call Handler            |
| BDLT     | DBFBDLT0 | Entry                             | MSDB Delete Call             |
| CDLT     | DBFBDLT0 | Delete OK                         | MSDB Delete Call             |
| RDLT     | DBFBDLT0 | Exit                              | MSDB Delete Call             |
| BENQ     | DBFBENQ0 | Entry                             | MSDB Resource Locking        |
| NQ16     | DBFBENQ0 | Function 16 = Enqueue             | MSDB Resource Locking        |
| ENQ1     | DBFBENQ0 | Resource Locked, call Lock Manger | MSDB Resource Locking        |
| ENQ2     | DBFBENQ0 | Resource Locked                   | MSDB Resource Locking        |
| RENQ     | DBFBENQ0 | Exit                              | MSDB Resource Locking        |
| BDEQ     | DBFBENQ0 | Dequeue                           | MSDB Resource Locking        |
| BFLD     | DBFBFLD0 | Entry                             | MSDB FLD Call Processor      |
| RFLD     | DBFBFLD0 | Exit                              | MSDB FLD Call Processor      |
| BGET     | DBFBGET0 | Entry                             | MSDB Get Processor           |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                             | Comments                                     |
|----------|----------|-----------------------------------------|----------------------------------------------|
| RGET     | DBFBGET0 | Exit                                    | MSDB Get Processor                           |
| BINC     | DBFBINC0 | Entry, Exit (Shift)                     | MSDB Decimal Field Verify                    |
| BNXT     | DBFBNXT0 | Entry                                   | MSDB Get Next                                |
| RNXT     | DBFBNXT0 | Exit                                    | MSDB Get Next                                |
| BRPL     | DBFBRPL0 | Entry                                   | MSDB Replace                                 |
| RRPL     | DBFBRPL0 | Exit                                    | MSDB Replace                                 |
| BSEQ     | DBFBSEQ0 | Entry, Exit (Shift)                     | MSDB Sequential Search                       |
| SEQ1     | DBFBSEQ0 | ECNT Search<br>Entry,Exit (Shift)       | MSDB Sequential Search                       |
| SEQI     | DBFBSEQ0 | ECNT Scan                               | MSDB Sequential Search                       |
| SEQ2     | DBFBSEQ0 | Segment Search<br>Entry, Exit (Shift)   | MSDB Sequential Search                       |
| SEQ3     | DBFBSEQ0 | Search Forward<br>Entry, Exit (Shift)   | MSDB Sequential Search                       |
| BSRT     | DBFBSRT0 | Entry                                   | MSDB Insert Processor                        |
| CSRT     | DBFBSRT0 | Count Free Segments                     | MSDB Insert Processor                        |
| DSRT     | DBFBSRT0 | Insert Complete                         | MSDB Insert Processor                        |
| RSRT     | DBFBSRT0 | Exit                                    | MSDB Insert Processor                        |
| BUPB     | DBFBUPB0 | Entry                                   | MSDB Update Buffer Space Handler             |
| RUPB     | DBFBUPB0 | Exit                                    | MSDB Update Buffer Space Handler             |
| BVAL     | DBFBVAL0 | Entry,Exit (Shift)                      | MSDB Decimal Segment Validate                |
| BVfy     | DBFBVfy0 | Entry                                   | MSDB Field Verify Processor                  |
| RVfy     | DBFBVfy0 | Exit                                    | MSDB Field Verify Processor                  |
| BXTR     | DBFBXTR0 | Entry,Exit (Shift)                      | MSDB Hex Field Translator                    |
| CBHL     | DBFCBHL0 | Entry                                   | DEDB Hard Luck Buffer Handler (Buffer Steal) |
| YBHL     | DBFCBHL0 | Exit to caller or to<br>wait for buffer | DEDB Hard Luck Buffer Handler (Buffer Steal) |
| ZBHL     | DBFCBHL0 | OBA required                            | DEDB Hard Luck Buffer Handler (Buffer Steal) |
| BDU0     | DBFDBDU0 | Entry                                   | MSDB Log Update Processor                    |
| CHGA     | DBFDBDU0 | Change - Before                         | MSDB Log Update Processor                    |
| CHGB     | DBFDBDU0 | Change - After                          | MSDB Log Update Processor                    |
| DECA     | DBFDBDU0 | Decimal Operation -<br>Before           | MSDB Log Update Processor                    |
| DECB     | DBFDBDU0 | Decimal Operation -<br>After            | MSDB Log Update Processor                    |
| DLTA     | DBFDBDU0 | Delete - Before                         | MSDB Log Update Processor                    |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                         | Comments                                |
|----------|----------|-------------------------------------|-----------------------------------------|
| DLBT     | DBFDBDU0 | Delete - After                      | MSDB Log Update Processor               |
| SRTA     | DBFDBDU0 | Insert - Before                     | MSDB Log Update Processor               |
| SRTB     | DBFDBDU0 | Insert - After                      | MSDB Log Update Processor               |
| RDU0     | DBFDBDU0 | Exit                                | MSDB Log Update Processor               |
| DCAP     | DBFDCAP0 | Entry                               | DEDB Change Data Capture                |
| CAPD     | DBFDCAP0 | Build CAPD Block                    | DEDB Change Data Capture                |
| DATA     | DBFDCAP0 | Build CAPD_DATA Blocks              | DEDB Change Data Capture                |
| READ     | DBFDCAP0 | Read DEDB CI                        | DEDB Change Data Capture                |
| DCAX     | DBFDCAP0 | Should not occur, invalid call type | DEDB Change Data Capture                |
| SLG2     | DBFDLG20 | Good Sync                           | FP Resync Commit/Abort Log Processor    |
| SLOG     | DBFDLG20 | Bad Sync                            | FP Resync Commit/Abort Log Processor    |
| TLG2     | DBFDLG20 | Exit                                | FP Resync Commit/Abort Log Processor    |
| DRSC     | DBFDRSC0 | Entry                               | FP Resync Controller                    |
| DSRP     | DBFDSRP0 | Entry                               | DEDB SDEP Resync Processor              |
| DSRN     | DBFDSRP0 | Exit                                | DEDB SDEP Resync Processor              |
| HCHG     | DBFHCHG0 | Entry                               | EMH Alt PCB CHNG Call Processor         |
| NCHG     | DBFHCHG0 | Exit                                | EMH Alt PCB CHNG Call Processor         |
| HCL0     | DBFHCL00 | Entry                               | EMH and FP Utility Call Analyzer        |
| NCL0     | DBFHCL00 | Exit                                | EMH and FP Utility Call Analyzer        |
| HGN0     | DBFHGN00 | Entry                               | EMH Get Next Call Processor             |
| NGN0     | DBFHGN00 | Exit                                | EMH Get Next Call Processor             |
| HGU1     | DBFHGU10 | Entry                               | EMH Get Unique + Sync Control Processor |
| NGU1     | DBFHGU10 | Exit                                | EMH Get Unique + Sync Control Processor |
| EOTR     | DBFHGU10 | End of Thread                       | EMH Get Unique + Sync Control Processor |
| RTRY     | DBFHGU10 | Retried Transaction                 | EMH Get Unique + Sync Control Processor |
| BOTR     | DBFHGU10 | Start of Thread                     | EMH Get Unique + Sync Control Processor |
| HRLB     | DBFHRLB0 | Entry                               | EMH ROLB Processor                      |
| NRLB     | DBFHRLB0 | Exit                                | EMH ROLB Processor                      |
| HSRT     | DBFHSRT0 | Entry                               | EMH TP PCB ISRT Processor               |
| NSRT     | DBFHSRT0 | Exit                                | EMH TP PCB ISRT Processor               |
| FPR3     | DBFIRC10 | DL/I Call Start                     | FP Inter-Region Communication           |
| IRC1     | DBFIRC10 | DL/I Call                           | FP Inter-Region Communication           |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                       | Comments                          |
|----------|----------|-----------------------------------|-----------------------------------|
| IR09     | DBFIRC10 | Post Call, DEDB FLD, or MSDB      | FP Inter-Region Communication     |
| OPMV     | DBFIRC10 | Post Call, Move Data to Dependent | FP Inter-Region Communication     |
| IRCZ     | DBFIRC10 | Post Call, Pseudo Abend Set       | FP Inter-Region Communication     |
| MBED     | DBFMBEDO | Entry                             | DEDB Get CI                       |
| MBE2     | DBFMBEDO | HSSP Async Read Ahead Wait        | DEDB Get CI                       |
| MBEH     | DBFMBEDO | HSSP, found CI in Private Buffer  | DEDB Get CI                       |
| GPRS     | DBFMBEDO | Exit without XCRB                 | DEDB Get CI                       |
| NBED     | DBFMBEDO | Exit                              | DEDB Get CI                       |
| BFL9     | DBFMBFL9 | Entry                             | Build FLDC for ISRT               |
| BFLX     | DBFMBFL9 | Exit                              | Build FLDC for ISRT               |
| MBMM     | DBFMBMM9 | Entry                             | Build SSAs, set Minimum   Maximum |
| MB02     | DBFMBMM9 | GT Operator no Minimum            | Build SSAs, set Minimum   Maximum |
| MB03     | DBFMBMM9 | GT Operator Minimum               | Build SSAs, set Minimum   Maximum |
| MB04     | DBFMBMM9 | GE Operator no Minimum            | Build SSAs, set Minimum   Maximum |
| MB05     | DBFMBMM9 | GE Operator Minimum               | Build SSAs, set Minimum   Maximum |
| MB06     | DBFMBMM9 | LT Operator no Maximum            | Build SSAs, set Minimum   Maximum |
| MB07     | DBFMBMM9 | LT Operator Maximum               | Build SSAs, set Minimum   Maximum |
| MB08     | DBFMBMM9 | LE Operator no Maximum            | Build SSAs, set Minimum   Maximum |
| MB09     | DBFMBMM9 | Invalid Boolean Operator          | Build SSAs, set Minimum   Maximum |
| MB10     | DBFMBMM9 | EQ Operator set Maximum           | Build SSAs, set Minimum   Maximum |
| MB11     | DBFMBMM9 | EQ Operator Maximum already set   | Build SSAs, set Minimum   Maximum |
| MB12     | DBFMBMM9 | Set Minimum                       | Build SSAs, set Minimum   Maximum |
| MB13     | DBFMBMM9 | Minimum already set               | Build SSAs, set Minimum   Maximum |
| MB14     | DBFMBMM9 | NE Operator                       | Build SSAs, set Minimum   Maximum |
| MB15     | DBFMBMM9 | No Key Fields                     | Build SSAs, set Minimum   Maximum |



Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                   | Comments                          |
|----------|----------|-------------------------------|-----------------------------------|
| MB16     | DBFMBMM9 | Error in Maximum or Minimum   | Build SSAs, set Minimum   Maximum |
| MB17     | DBFMBMM9 | Set Maximum into SSA          | Build SSAs, set Minimum   Maximum |
| MB18     | DBFMBMM9 | Set Maximum into SSA          | Build SSAs, set Minimum   Maximum |
| MB19     | DBFMBMM9 | Set Maximum into SSA          | Build SSAs, set Minimum   Maximum |
| MB20     | DBFMBMM9 | Maximum zero                  | Build SSAs, set Minimum   Maximum |
| MB21     | DBFMBMM9 | Set Minimum into SSA          | Build SSAs, set Minimum   Maximum |
| MB22     | DBFMBMM9 | Set Minimum into SSA          | Build SSAs, set Minimum   Maximum |
| MB23     | DBFMBMM9 | Set Minimum into SSA          | Build SSAs, set Minimum   Maximum |
| MB25     | DBFMBMM9 | Set Minimum into SSA          | Build SSAs, set Minimum   Maximum |
| MB26     | DBFMBMM9 | Minimum zero                  | Build SSAs, set Minimum   Maximum |
| MBMM     | DBFMBMM9 | Exit                          | Build SSAs, set Minimum   Maximum |
| CVAL     | DBFMCCV9 | Entry, Exit (Shift)           | Check Command Code Validity       |
| SSP1     | DBFMCCV9 | Subset Pointer                | Check Command Code Validity       |
| SSR1     | DBFMCCV9 | Command Code R                | Check Command Code Validity       |
| SSP2     | DBFMCCV9 | Other Subset Command          | Check Command Code Validity       |
| SSP3     | DBFMCCV9 | Check for Conflicts           | Check Command Code Validity       |
| SSPX     | DBFMCCV9 | Check Subset Pointer Conflict | Check Command Code Validity       |
| SSP4     | DBFMCCV9 | Set Pointers                  | Check Command Code Validity       |
| SSP5     | DBFMCCV9 | Not Command Code C            | Check Command Code Validity       |
| SSP6     | DBFMCCV9 | Command Code C                | Check Command Code Validity       |
| SSP7     | DBFMCCV9 | Command Code F or R           | Check Command Code Validity       |
| SSP8     | DBFMCCV9 | F, R, or L not at ISRT Level  | Check Command Code Validity       |
| LOPP     | DBFMCCV9 | Loop checking position        | Check Command Code Validity       |
| ELOP     | DBFMCCV9 | End of loop checking position | Check Command Code Validity       |
| SSP9     | DBFMCCV9 | F, R, or L at ISRT level      | Check Command Code Validity       |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                         | Comments                             |
|----------|----------|-------------------------------------|--------------------------------------|
| SSPA     | DBFMCCV9 | Command Code U                      | Check Command Code Validity          |
| LOPU     | DBFMCCV9 | Loop checking position back to root | Check Command Code Validity          |
| SSPB     | DBFMCCV9 | Command Code V                      | Check Command Code Validity          |
| AMST     | DBFMCCV9 | Status Code AM set                  | Check Command Code Validity          |
| AJST     | DBFMCCV9 | Status Code AJ set                  | Check Command Code Validity          |
| MCHG     | DBFMCHG0 | Entry                               | DEDB FLD Call Processor              |
| XCHG     | DBFMCHG0 | Exit                                | DEDB FLD Call Processor              |
| MOFL     | DBFMCHG0 | Overflow                            | DEDB FLD Call Processor              |
| MCL0     | DBFMCLX0 | Entry                               | DEDB Call Analyzer                   |
| SSAX     | DBFMCLX0 | Count SSAs                          | DEDB Call Analyzer                   |
| SEG4     | DBFMCLX0 | Good RC, Trace Segment              | DEDB Call Analyzer                   |
| PARP     | DBFMCLX0 | Trace Parent                        | DEDB Call Analyzer                   |
| NCL0     | DBFMCLX0 | Exit                                | DEDB Call Analyzer                   |
| CRP9     | DBFMCRP9 | Entry                               | Check for Subset Pointer             |
| PPRE     | DBFMCRP9 | Trace Parent Prefix                 | Check for Subset Pointer             |
| CRPX     | DBFMCRP9 | Exit                                | Check for Subset Pointer             |
| MCSS     | DBFMCSS9 | Entry                               | Compare Current Segment Field to SSA |
| CALL     | DBFMCSS9 | Entry, Trace Call Argument          | Compare Current Segment Field to SSA |
| MC01     | DBFMCSS9 | Key SSA + Key Value                 | Compare Current Segment Field to SSA |
| MC02     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC03     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC04     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC05     | DBFMCSS9 | Not Satisfied RC=8                  | Compare Current Segment Field to SSA |
| MC06     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC07     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC08     | DBFMCSS9 | Not Satisfied RC=12                 | Not Satisfied RC=12                  |
| MC09     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC10     | DBFMCSS9 | Compare Key                         | Compare Current Segment Field to SSA |
| MC11     | DBFMCSS9 | Compare                             | Compare Current Segment Field to SSA |
| MC12     | DBFMCSS9 | Compare                             | Compare Current Segment Field to SSA |
| MC13     | DBFMCSS9 | Compare                             | Compare Current Segment Field to SSA |
| MC14     | DBFMCSS9 | Compare                             | Compare Current Segment Field to SSA |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                       | Comments                                        |
|----------|----------|-----------------------------------|-------------------------------------------------|
| MC1A     | DBFMCSS9 | No Match                          | Compare Current Segment Field to SSA            |
| MC1B     | DBFMCSS9 | Compare                           | Compare Current Segment Field to SSA            |
| CSSF     | DBFMCSS9 | Compare, no Boolean               | Compare Current Segment Field to SSA            |
| MCS2     | DBFMCSS9 | Relational Operator Satisfied     | Compare Current Segment Field to SSA            |
| MCS1     | DBFMCSS9 | Relational Operator Not Satisfied | Compare Current Segment Field to SSA            |
| CSS9     | DBFMCSS9 | Exit                              | Compare Current Segment Field to SSA            |
| CSL9     | DBFMCSL9 | Entry,Exit (Shift)                | Compare Current Segment Field to SSA            |
| CALL     | DBFMCSL9 | Entry, Trace Call Argument        | Compare Current Segment Field to SSA            |
| LOPC     | DBFMCSL9 | Compare Loop                      | Compare Current Segment Field to SSA            |
| NEXT     | DBFMCSL9 | Read Next Buffer                  | Compare Current Segment Field to SSA            |
| MCTL     | DBFMCTL0 | Entry, Exit (Shift)               | Check this Level                                |
| COML     | DBFMCTL0 | Command Code L                    | Check this Level                                |
| FRST     | DBFMCTL0 | Command Code F, R, or unqualified | Check this Level                                |
| GETN     | DBFMCTL0 | Get Next                          | Check this Level                                |
| ISRT     | DBFMCTL0 | ISRT Here                         | Check this Level                                |
| MCT3     | DBFMCTL0 | Trace Process Return Code         | Check this Level                                |
| MDEQ     | DBFMDEQ0 | Entry                             | DEDB DEQ Command Processor                      |
| XDEQ     | DBFMDEQ0 | Exit                              | DEDB DEQ Command Processor                      |
| MDLT     | DBFMDLT0 | Entry                             | DEDB Direct Delete                              |
| EPCB     | DBFMDLT0 | Check for other PCBs              | DEDB Direct Delete                              |
| PRBA     | DBFMDLT0 | Update other PCB PRBA             | DEDB Direct Delete                              |
| CRBA     | DBFMDLT0 | Clear other PCB CRBA              | DEDB Direct Delete                              |
| KILL     | DBFMDLT0 | Reset Parentage other PCB         | DEDB Direct Delete                              |
| NRBA     | DBFMDLT0 | Update other PCB NRBA             | DEDB Direct Delete                              |
| XRBA     | DBFMDLT0 | Update other PCB XRBA             | DEDB Direct Delete                              |
| GRBA     | DBFMDLT0 | Update other PCB GRBA             | DEDB Direct Delete                              |
| DPT9     | DBFMDPT9 | Entry                             | Delete PCL and Subset Pointers in Parent Prefix |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                       | Comments                                        |
|----------|----------|-----------------------------------|-------------------------------------------------|
| DPTX     | DBFMDPT9 | Exit                              | Delete PCL and Subset Pointers in Parent Prefix |
| MDRA     | DBFMDRA9 | Entry,Exit (Shift)                | Determine possibility of randomizing            |
| MD01     | DBFMDRA9 | Read First Root                   | Determine possibility of randomizing            |
| MD02     | DBFMDRA9 | Use Current Position              | Determine possibility of randomizing            |
| MD03     | DBFMDRA9 | Cannot use CP, randomize          | Determine possibility of randomizing            |
| MD04     | DBFMDRA9 | Current key LT SSA min, randomize | Determine possibility of randomizing            |
| MD05     | DBFMDRA9 | Must Move this Level              | Determine possibility of randomizing            |
| MD06     | DBFMDRA9 | Current Key GT SSA min            | Determine possibility of randomizing            |
| MD07     | DBFMDRA9 | Current Key GT SSA min            | Determine possibility of randomizing            |
| MD08     | DBFMDRA9 | Current Key GT SSA max            | Determine possibility of randomizing            |
| MD09     | DBFMDRA9 | Must Move this Level              | Determine possibility of randomizing            |
| MD10     | DBFMDRA9 | Level Acceptable                  | Determine possibility of randomizing            |
| MD11     | DBFMDRA9 | Current Key LT SSA max            | Determine possibility of randomizing            |
| MD12     | DBFMDRA9 | Current Key GT SSA max            | Determine possibility of randomizing            |
| MD13     | DBFMDRA9 | Current Key LT SSA max            | Determine possibility of randomizing            |
| MD14     | DBFMDRA9 | Must Move this Level              | Determine possibility of randomizing            |
| MD15     | DBFMDRA9 | Level Acceptable                  | Determine possibility of randomizing            |
| MA13     | DBFMDRA9 | SSA Min = SSA Max, randomizer     | Determine possibility of randomizing            |
| MD19     | DBFMDRA9 | Set SSA Min, Max                  | Determine possibility of randomizing            |
| MD20     | DBFMDRA9 | No Low Boundary                   | Determine possibility of randomizing            |
| MD21     | DBFMDRA9 | Current Key LT SSA Max            | Determine possibility of randomizing            |
| MD22     | DBFMDRA9 | Must Move this Level              | Determine possibility of randomizing            |
| MD23     | DBFMDRA9 | Do Nothing                        | Determine possibility of randomizing            |
| MD24     | DBFMDRA9 | Current Key GT SSA Max            | Determine possibility of randomizing            |
| MD26     | DBFMDRA9 | Do Sequential Read                | Determine possibility of randomizing            |
| MD27     | DBFMDRA9 | Do Sequential Read                | Determine possibility of randomizing            |
| MD28     | DBFMDRA9 | Do Nothing                        | Determine possibility of randomizing            |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                        | Comments                             |
|----------|----------|------------------------------------|--------------------------------------|
| MD29     | DBFMDRA9 | Current Key LT SSA Max             | Determine possibility of randomizing |
| MD31     | DBFMDRA9 | Current Key GT FDLC Low Key        | Determine possibility of randomizing |
| MD32     | DBFMDRA9 | Current Key GT FDLC Low Key        | Determine possibility of randomizing |
| MD33     | DBFMDRA9 | Do Nothing                         | Determine possibility of randomizing |
| MD34     | DBFMDRA9 | Do Sequential Read                 | Determine possibility of randomizing |
| MD35     | DBFMDRA9 | Do Nothing                         | Determine possibility of randomizing |
| MD36     | DBFMDRA9 | Do Sequential Read                 | Determine possibility of randomizing |
| MD37     | DBFMDRA9 | Do Nothing                         | Determine possibility of randomizing |
| MD38     | DBFMDRA9 | Go to Next Set Process             | Determine possibility of randomizing |
| MD41     | DBFMDRA9 | Search for Lowest Min GT Current   | Determine possibility of randomizing |
| MD42     | DBFMDRA9 | Search for Next Higher Set Minimum | Determine possibility of randomizing |
| MD43     | DBFMDRA9 | Address next Set                   | Determine possibility of randomizing |
| MD44     | DBFMDRA9 | Set Min Found, Randomize           | Determine possibility of randomizing |
| MD45     | DBFMDRA9 | Goto NOUSE                         | Determine possibility of randomizing |
| MD46     | DBFMDRA9 | Read First Root                    | Determine possibility of randomizing |
| MD47     | DBFMDRA9 | Do Nothing - current position good | Determine possibility of randomizing |
| MD48     | DBFMDRA9 | Clear current position             | Determine possibility of randomizing |
| MD49     | DBFMDRA9 | Call Randomizer                    | Determine possibility of randomizing |
| MD50     | DBFMDRA9 | Continue Sequential Read           | Determine possibility of randomizing |
| MDRB     | DBFMDRB0 | Entry                              | Delete, get root backwards           |
| MDRT     | DBFMDRX0 | Entry, Exit DDEP,SDEP (Shift)      | DEDB Insert                          |
| DSG9     | DBFMDSG9 | Entry                              | DEDB Delete Direct Dependent         |
| RECU     | DBFMDSG9 | Recursive Call Stack Information   | DEDB Delete Direct Dependent         |
| DSG1     | DBFMDSG9 | Trace Segment to be processed      | DEDB Delete Direct Dependent         |
| LOP1     | DBFMDSG9 | Twin Chain Loop                    | DEDB Delete Direct Dependent         |
| SIBL     | DBFMDSG9 | First Child                        | DEDB Delete Direct Dependent         |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                      | Comments                                         |
|----------|----------|----------------------------------|--------------------------------------------------|
| LO1X     | DBFMDSG9 | Loop over Parent Prefix Complete | DEDB Delete Direct Dependent                     |
| FRE1     | DBFMDSG9 | Call DBFMFSE0 to free space      | DEDB Delete Direct Dependent                     |
| LOP2     | DBFMDSG9 | Twin Chain Loop                  | DEDB Delete Direct Dependent                     |
| FRE2     | DBFMDSG9 | Call DBFMFSE0 to free space      | DEDB Delete Direct Dependent                     |
| DSGX     | DBFMDSG9 | Exit                             | DEDB Delete Direct Dependent                     |
| DS14     | DBFMDSG9 | Return after Recursive Call      | DEDB Delete Direct Dependent                     |
| MFLO     | DBFMFL00 | Entry                            | DEDB FLD Call Processor                          |
| XMFL     | DBFMFL00 | Exit                             | DEDB FLD Call Processor                          |
| MFLD     | DBFMFL10 | Entry                            | DEDB FSA Processor                               |
| XFLD     | DBFMFL10 | Exit                             | DEDB FSA Processor                               |
| MFSE     | DBFMFSE0 | Entry                            | DEDB Space Manager                               |
| MFSS     | DBFMFSE0 | Scrap Handling                   | DEDB Space Manager                               |
| NFSE     | DBFMFSE0 | Exit                             | DEDB Space Manager                               |
| OFSE     | DBFMFSE0 | Read AP or Root CI to find space | DEDB Space Manager                               |
| PFSE     | DBFMFSE0 | Read 1st DOVF CI                 | DEDB Space Manager                               |
| GPDS     | DBFMFSE0 | Got Conditional Lock IOVF SM CI  | DEDB Space Manager                               |
| GPDN     | DBFMFSE0 | Bad Conditional Lock IOVF SM CI  | DEDB Space Manager                               |
| MGAP     | DBFMGAP0 | Entry                            | DEDB Get Anchor Point                            |
| ERAN     | DBFMGAP0 | Entry to Randomizer              | DEDB Get Anchor Point                            |
| XRAN     | DBFMGAP0 | Exit from Randomizer             | DEDB Get Anchor Point                            |
| MGA1     | DBFMGAP0 | PROCOPT=P UOW BDY crossed        | DEDB Get Anchor Point                            |
| MGA2     | DBFMGAP0 | PROCOPT=P UOW Set GC status      | DEDB Get Anchor Point                            |
| MGA3     | DBFMGAP0 | PROCOPT=H Save Position          | DEDB Get Anchor Point                            |
| NGAP     | DBFMGAP0 | Exit                             | DEDB Get Anchor Point                            |
| MGFD     | DBFMGFD0 | Entry                            | DEDB Initialize Level Table                      |
| NGFD     | DBFMGFD0 | Exit                             | DEDB Initialize Level Table                      |
| MGL9     | DBFMGLA9 | Entry, Exit (Shift)              | DEDB Get Last Occurrence of Segment Under Parent |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                            | Comments                                                                  |
|----------|----------|----------------------------------------|---------------------------------------------------------------------------|
| CLA9     | DBFMGLA9 | Enter, Exit(shift) EP<br>DBFMCLA9      | DEDB Check if Another Occurrence of<br>Segment under Parent satisfies SSA |
| MGNR     | DBFMGNR0 | Entry                                  | DEDB Get Next Root                                                        |
| NGNR     | DBFMGNR0 | Exit                                   | DEDB Get Next Root                                                        |
| EXAP     | DBFMGNR0 | Get Next RAP with a<br>root start loop | DEDB Get Next Root                                                        |
| EXA1     | DBFMGNR0 | Get Next RAP with a<br>root block#     | DEDB Get Next Root                                                        |
| EOC1     | DBFMGNR0 | Out of Area Range                      | DEDB Get Next Root                                                        |
| EXA2     | DBFMGNR0 | Read CI                                | DEDB Get Next Root                                                        |
| XXAP     | DBFMGNR0 | Return the RAP                         | DEDB Get Next Root                                                        |
| ECAL     | DBFMGNR0 | Calc UOW#, DMAC<br>from BLK#           | DEDB Get Next Root                                                        |
| ECA1     | DBFMGNR0 | PROCOPT=P set GC<br>status             | DEDB Get Next Root                                                        |
| ECA2     | DBFMGNR0 | PROCOPT=P set GC<br>status             | DEDB Get Next Root                                                        |
| XCAL     | DBFMGNR0 | Rerun UOW#, DMAC                       | DEDB Get Next Root                                                        |
| MGN0     | DBFMGNX0 | Entry, Exit(Shift)                     | DEDB Get Next Root                                                        |
| GPDE     | DBFMGPDO | Entry                                  | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPD1     | DBFMGPDO | Scan Segment Chain                     | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPD2     | DBFMGPDO | SDEP Pointer -><br>uncommitted seg     | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPD3     | DBFMGPDO | SDEP Pointer -><br>normal seg          | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPD4     | DBFMGPDO | Must Read CI                           | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPDS     | DBFMGPDO | IRLM Notify to<br>Partner              | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GDPN     | DBFMGPDO | SDEP CI found to be<br>locked          | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GDP7     | DBFMGPDO | Re-read CI                             | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GDPG     | DBFMGPDO | Compare Segment to<br>SSA              | DEDB Retrieve Sequential Dependent<br>Segment                             |
| GPD5     | DBFMGPDO | SSA does not match<br>this segment     | DEDB Retrieve Sequential Dependent<br>Segment                             |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                            | Comments                                   |
|----------|----------|----------------------------------------|--------------------------------------------|
| GPD6     | DBFMGPD0 | Copy segment                           | DEDB Retrieve Sequential Dependent Segment |
| GDPX     | DBFMGPD0 | Exit                                   | DEDB Retrieve Sequential Dependent Segment |
| MGPF     | DBFMGPF0 | Entry                                  | Get Page of Common Storage                 |
| NGPF     | DBFMGPF0 | Exit                                   | Get Page of Common Storage                 |
| MGRF     | DBFMGRF0 | Entry                                  | Get Root Forward Search                    |
| MGR1     | DBFMGRF0 | Run Chain in RAP CI                    | Get Root Forward Search                    |
| MGR2     | DBFMGRF0 | Scan RAP CI                            | Get Root Forward Search                    |
| MGR3     | DBFMGRF0 | Run Chain next CI                      | Get Root Forward Search                    |
| MGR4     | DBFMGRF0 | Scan next CI                           | Get Root Forward Search                    |
| MGR5     | DBFMGRF0 | Root does not exist (status GE)        | Get Root Forward Search                    |
| MGR6     | DBFMGRF0 | Root does not exist, other roots found | Get Root Forward Search                    |
| MGR8     | DBFMGRF0 | Root found during a scan               | Get Root Forward Search                    |
| MGR9     | DBFMGRF0 | Root found by Run Chain                | Get Root Forward Search                    |
| NGRF     | DBFMGRF0 | Exit                                   | Get Root Forward Search                    |
| MGRG     | DBFMGRF0 | Anchor Point Scan routine              | Get Root Forward Search                    |
| MGRL     | DBFMGRF0 | CI Scan routine                        | Get Root Forward Search                    |
| MGRM     | DBFMGRF0 | Nextitem routine                       | Get Root Forward Search                    |
| MGRC     | DBFMGRF0 | Call DBFMPG00 check PROCOPT            | Get Root Forward Search                    |
| MGRD     | DBFMGRF0 | Return from DBFMPG00                   | Get Root Forward Search                    |
| MGU0     | DBFMGUX0 | Entry, Exit(Shift)                     | Get Unique, Unqualified                    |
| MGXC     | DBFMGXCO | Entry, Entry SEGLOCK                   | Get Control of Resource                    |
| NGXC     | DBFMGXCO | Exit, Entry SEGLOCK, Exit CI EXCL      | Get Control of Resource                    |
| ENQR     | DBFMGXCO | Lock Resource for this caller          | Get Control of Resource                    |
| ENQO     | DBFMGXCO | Lock Resource on behalf of other       | Get Control of Resource                    |
| SHXC     | DBFMGXCO | Just CI SHR Lock, Entry/Exit           | Get Control of Resource                    |



Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                       | Comments                                       |
|----------|----------|-----------------------------------|------------------------------------------------|
| EXXC     | DBFMGXCO | Just CI Lock Exclusive, Entry     | Get Control of Resource                        |
| VLOC     | DBFMGXCO | DBFVLOCK Entry                    | Get Control of Resource                        |
| NLOC     | DBFMGXCO | DBFVLOCK Exit                     | Get Control of Resource                        |
| MINC     | DBFMINCO | Entry                             | DEDB Included Decimal FLD Call                 |
| XINC     | DBFMINCO | Exit                              | DEDB Included Decimal FLD Call                 |
| IRC9     | DBFMIRC9 | Entry, Exit(Shift)                | DEDB Retrieve Previous Parent, Set MLTE Fields |
| MIRT     | DBFMIRTO | Entry, Exit(Shift)                | DEDB Insert                                    |
| MIR1     | DBFMIRTO | Trace CI RBA                      | DEDB Insert                                    |
| MIR2     | DBFMIRTO | Previous Root Twin not in Same CI | DEDB Insert                                    |
| MIR3     | DBFMIRTO | Trace after reading CI            | DEDB Insert                                    |
| MIR4     | DBFMIRTO | Previous Segment not in Same CI   | DEDB Insert                                    |
| MIR5     | DBFMIRTO | Previous Segment not Parent       | DEDB Insert                                    |
| MIRB     | DBFMIRTO | Set PCF Pointer in Parent         | DEDB Insert                                    |
| MIR6     | DBFMIRTO | Previous Segment in Same CI       | DEDB Insert                                    |
| MIR7     | DBFMIRTO | Update RAP -> new segment         | DEDB Insert                                    |
| MIR8     | DBFMIRTO | Previous is not a RAP             | DEDB Insert                                    |
| MIR9     | DBFMIRTO | Previous Segment is Twin          | DEDB Insert                                    |
| MIRA     | DBFMIRTO | Set Log Data                      | DEDB Insert                                    |
| ISLL     | DBFMISL9 | Entry, Exit(Shift)                | DEDB Process Insert Last Level                 |
| MLCS     | DBFMLCLO | Entry                             | DEDB Logical Close Area                        |
| MLCE     | DBFMLCLO | Exit                              | DEDB Logical Close Area                        |
| MLEV     | DBFMLEVO | Entry                             | DEDB Adjust MLTE Sequence Numbers              |
| NLEV     | DBFMLEVO | Exit                              | DEDB Adjust MLTE Sequence Numbers              |
| MLOG     | DBFMLOGO | Entry                             | DEDB SDEP CI Logging                           |
| NLOG     | DBFMLOGO | Exit                              | DEDB SDEP CI Logging                           |
| MLOS     | DBFMLOPO | Entry                             | DEDB Logical Open Area                         |
| MLOE     | DBFMLOPO | Exit                              | DEDB Logical Open Area                         |
| MMIT     | DBFMMITO | Entry                             | DEDB Media Manager Connect/Disconnect          |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                        | Comments                                                |
|----------|----------|------------------------------------|---------------------------------------------------------|
| MMIE     | DBFMMIT0 | Exit                               | DEDB Media Manager Connect/Disconnect                   |
| MOCI     | DBFMOCIO | Entry                              | DEDB DMAC Update                                        |
| NOCI     | DBFMOCIO | Exit                               | DEDB DMAC Update                                        |
| PCC9     | DBFMPC9  | Entry, Exit(Shift)                 | DEDB Process 'C' Command Code                           |
| MCLS     | DBFMPCLO | Entry                              | DEDB Physical Area Close                                |
| MCLE     | DBFMPCLO | Exit                               | DEDB Physical Area Close                                |
| PED9     | DBFMPE9  | Entry,Exit (Shift)                 | DEDB Process Position Fields in Parallel EPCBs - DELETE |
| PEI9     | DBFMPEI9 | Entry, Exit (Shift)                | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| LOP1     | DBFMPEI9 | Loop through EPCBs                 | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| LOP2     | DBFMPEI9 | Loop through MLTEs                 | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| FRGU     | DBFMPEI9 | Update before EPCB GU Position     | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| FGRN     | DBFMPEI9 | Update before EPCB GN Position     | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| AFGU     | DBFMPEI9 | Update after EPCB GU Position      | DEDB Process Position Fields in Parallel EPCBs - INSERT |
| DPTE     | DBFMPE9  | Entry                              | DEDB Relocate PCL or SSPT in Parent                     |
| DPTX     | DBFMPE9  | Exit                               | DEDB Relocate PCL or SSPT in Parent                     |
| MPGO     | DBFMPGO0 | Entry, Exit(Shift)                 | DEDB Process PROCOPT GOX, GON                           |
| PIO9     | DBFMPIO9 | Entry, Exit(Shift)                 | DEDB Process I/O Area for REPLACE                       |
| MOPS     | DBFMPOPO | Entry                              | DEDB Physical Area Open                                 |
| MOPE     | DBFMPOPO | Exit                               | DEDB Physical Area Open                                 |
| MPOS     | DBFMPOS0 | Entry                              | DEDB POS Call                                           |
| NPOS     | DBFMPOS0 | Exit                               | DEDB POS Call                                           |
| MGUP     | DBFMPOS0 | Entry to Find Root Segment         | DEDB POS Call                                           |
| MGNP     | DBFMPOS0 | Entry to find next SDEP Segment    | DEDB POS Call                                           |
| NGN0     | DBFMPOS0 | Exit from find next SDEP Segment   | DEDB POS Call                                           |
| MPO2     | DBFMPOS0 | Notify Partners to Harden SDEP Cis | DEDB POS Call                                           |
| VMAI     | DBFMPOS0 | Exit from Notify Partners          | DEDB POS Call                                           |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module    | Trace point                     | Comments                                     |
|----------|-----------|---------------------------------|----------------------------------------------|
| MPSG     | DBFMPSG9  | Entry, Exit(Shift)              | DEDB Process Subset Pointer Commands S W Z M |
| SSPL     | DBFMPSG9  | Loop down through MLTEs         | DEDB Process Subset Pointer Commands S W Z M |
| LOPC     | DBFMPSG9  | Loop over SSPTRs                | DEDB Process Subset Pointer Commands S W Z M |
| SCOM     | DBFMPSG9  | Command Code S                  | DEDB Process Subset Pointer Commands S W Z M |
| WCOM     | DBFMPSG9  | Command Code W                  | DEDB Process Subset Pointer Commands S W Z M |
| ZCOM     | DBFMPSG9  | Command Code Z                  | DEDB Process Subset Pointer Commands S W Z M |
| MPUG     | DBFM PUG0 | Entry, Exit(Shift)              | DEDB Process Unqualified GN                  |
| FCHL     | DBFM PUG0 | First Child                     | DEDB Process Unqualified GN                  |
| MUP1     | DBFM PUG0 | Move Up A Level                 | DEDB Process Unqualified GN                  |
| VIO1     | DBFM PUG0 | Violation 1                     | DEDB Process Unqualified GN                  |
| VIO2     | DBFM PUG0 | Violation 2                     | DEDB Process Unqualified GN                  |
| GSBL     | DBFM PUG0 | Get Sibling                     | DEDB Process Unqualified GN                  |
| MPU2     | DBFM PUG0 | Sibling Located                 | DEDB Process Unqualified GN                  |
| MRCU     | DBFMRCU0  | Entry, Exit(Shift)              | DEDB Read Current Dependent Segment          |
| MRPU     | DBFM RPU0 | Entry, Exit(Shift)              | DEDB Reset Position after Unqualified GN     |
| LMLT     | DBFM RPU0 | Loop through MLTEs              | DEDB Reset Position after Unqualified GN     |
| MRPL     | DBFM RPX0 | Entry, Exit(Shift)              | DEDB REPLACE                                 |
| AMST     | DBFM RPX0 | Return AM status code           | DEDB REPLACE                                 |
| SPR9     | DBFM RPX0 | Update PRBA in MLTE of children | DEDB REPLACE                                 |
| SPR1     | DBFM RPX0 | Loop through siblings           | DEDB REPLACE                                 |
| SPR2     | DBFM RPX0 | End loop through siblings       | DEDB REPLACE                                 |
| PED9     | DBFM RPX0 | End child PRBA updates          | DEDB REPLACE                                 |
| MRQC     | DBFM RQC0 | Entry, Exit(Shift)              | DEDB Retrieve by Qualified Call              |
| MRQU     | DBFM RQC0 | Check current position          | DEDB Retrieve by Qualified Call              |
| MRUU     | DBFM RQC0 | MLTE not qualified              | DEDB Retrieve by Qualified Call              |
| MRNQ     | DBFM RQC0 | Get Next Loop                   | DEDB Retrieve by Qualified Call              |
| MRNU     | DBFM RQC0 | Not qualified SSA               | DEDB Retrieve by Qualified Call              |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module    | Trace point                          | Comments                                    |
|----------|-----------|--------------------------------------|---------------------------------------------|
| MRUF     | DBFMRQCO  | At Least Root Satisfies              | DEDB Retrieve by Qualified Call             |
| REQ1     | DBFMRQCO  | Diverge U or GN *F                   | DEDB Retrieve by Qualified Call             |
| REQL     | DBFMRQCO  | MLTE downward loop qualification     | DEDB Retrieve by Qualified Call             |
| RC04     | DBFMRQCO  | Found, moved off current position    | DEDB Retrieve by Qualified Call             |
| RC08     | DBFMRQCO  | Not found at that level              | DEDB Retrieve by Qualified Call             |
| LROT     | DBFMRQCO  | Loop up to root                      | DEDB Retrieve by Qualified Call             |
| TOGH     | DBFMRQCO  | GU, all levels satisfied current pos | DEDB Retrieve by Qualified Call             |
| DIVE     | DBFMRQCO  | MLTE Loop to clear DIVERGE flag      | DEDB Retrieve by Qualified Call             |
| NOPA     | DBFMRQCO  | Not a PATH call                      | DEDB Retrieve by Qualified Call             |
| PMVE     | DBFMRQCO  | Data to be moved                     | DEDB Retrieve by Qualified Call             |
| PHIL     | DBFMRQCO  | Path call Highest Level to move      | DEDB Retrieve by Qualified Call             |
| PCOM     | DBFMRQCO  | Path call complete                   | DEDB Retrieve by Qualified Call             |
| PLOP     | DBFMRQCO  | Loop for P command up in MLTEs       | DEDB Retrieve by Qualified Call             |
| MRUC     | DBFMRU00  | Entry, Exit(Shift)                   | DEDB Reset U Command at Current/Lower Level |
| SFIT     | DBFMFSI9  | Entry, Exit(Shift)                   | DEDB Search Field Name                      |
| SFLP     | DBFMFSI9  | Loop over Fields in Segment          | DEDB Search Field Name                      |
| SFTP     | DBFMFSI9  | Verify Relational Operator           | DEDB Search Field Name                      |
| CALL     | DBFMFSI9  | Trace SSA and Fields                 | DEDB Search Field Name                      |
| SFO9     | DBFMFSO9  | Entry, Exit(Shift)                   | DEDB Set First Position of Segment Type     |
| PPRE     | DBFMFSO9  | Trace Parent Prefix                  | DEDB Set First Position of Segment Type     |
| SFOT     | DBFMFSO9  | No Floating Pointer in Call          | DEDB Set First Position of Segment Type     |
| SIMP     | DBFMFSIM9 | Entry, Exit(Shift)                   | DEDB Set Implied for Upper Levels of Call   |
| MSPC     | DBFMSPC0  | Entry                                | DEDB IOVF Free Space Calculator             |
| NSPC     | DBFMSPC0  | Exit                                 | DEDB IOVF Free Space Calculator             |
| MSRB     | DBFM SRB0 | Entry                                | DEDB Schedule DBFMIOS0 SRB routine          |
| NSRB     | DBFM SRB0 | Exit                                 | DEDB Schedule DBFMIOS0 SRB routine          |
| MSRT     | DBFM SRT0 | Entry                                | DEDB Insert SDEP Segment to LSRT            |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                    | Comments                         |
|----------|----------|--------------------------------|----------------------------------|
| NSRT     | DBFMSRT0 | Exit                           | DEDB Insert SDEP Segment to LSRT |
| MSR1     | DBFMSRT0 | MSRTCIAL entry                 | DEDB Preallocate SDEP Cis        |
| MSR2     | DBFMSRT0 | After Recheck #1 still need PA | DEDB Preallocate SDEP Cis        |
| MSR3     | DBFMSRT0 | After Recheck #2 still need PA | DEDB Preallocate SDEP Cis        |
| MSR4     | DBFMSRT0 | DMAC Read Error                | DEDB Preallocate SDEP Cis        |
| MSR5     | DBFMSRT0 | DMAC Read Successful           | DEDB Preallocate SDEP Cis        |
| MSR6     | DBFMSRT0 | SDEP Part full after DMAC Read | DEDB Preallocate SDEP Cis        |
| MSR7     | DBFMSRT0 | Allocate an RBAT               | DEDB Preallocate SDEP Cis        |
| MSR8     | DBFMSRT0 | DMACLBTS was zero, set here    | DEDB Preallocate SDEP Cis        |
| MSR9     | DBFMSRT0 | Trace ACCUM_LENG               | DEDB Preallocate SDEP Cis        |
| MSRA     | DBFMSRT0 | Trace RBAT, #Cis to allocate   | DEDB Preallocate SDEP Cis        |
| MSRB     | DBFMSRT0 | Trace RBAT, min # Cis          | DEDB Preallocate SDEP Cis        |
| MSRD     | DBFMSRT0 | SDEP Part now full             | DEDB Preallocate SDEP Cis        |
| MSRE     | DBFMSRT0 | SDEP Part now full             | DEDB Preallocate SDEP Cis        |
| MSRF     | DBFMSRT0 | Lock failure on SDEP PACI      | DEDB Preallocate SDEP Cis        |
| MSRG     | DBFMSRT0 | Add SDEP CI XCRBs to RBAT      | DEDB Preallocate SDEP Cis        |
| MSRH     | DBFMSRT0 | Trace ACCUM_LENG               | DEDB Preallocate SDEP Cis        |
| MLOG     | DBFMSRT0 | Log 5953 Record - entry        | DEDB Preallocate SDEP Cis        |
| NLOG     | DBFMSRT0 | Log 5953 Record - exit         | DEDB Preallocate SDEP Cis        |
| SSA9     | DBFMSSA9 | Entry, Exit(Shift)             | DEDB Search SSA for Data         |
| MMOV     | DBFMSSA9 | Must Move                      | DEDB Search SSA for Data         |
| BACK     | DBFMSSA9 | Must Move Back                 | DEDB Search SSA for Data         |
| STAY     | DBFMSSA9 | Stay at this Level             | DEDB Search SSA for Data         |
| FOND     | DBFMSSA9 | Found                          | DEDB Search SSA for Data         |
| COML     | DBFMSSA9 | Command Code L                 | DEDB Search SSA for Data         |
| TWLF     | DBFMSSA9 | Not found - higher key found   | DEDB Search SSA for Data         |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                     | Comments                                               |
|----------|----------|---------------------------------|--------------------------------------------------------|
| EIGH     | DBFMSSA9 | Not found, no higher key found  | DEDB Search SSA for Data                               |
| SAGI     | DBFMSSC9 | Entry, Exit(Shift)              | DEDB SSA Handler for GET and INSERT                    |
| ACST     | DBFMCSS9 | Count SSAs                      | DEDB SSA Handler for GET and INSERT                    |
| NAMF     | DBFMCSS9 | Segment Name Found              | DEDB SSA Handler for GET and INSERT                    |
| DESC     | DBFMCSS9 | Level Descending                | DEDB SSA Handler for GET and INSERT                    |
| NDES     | DBFMCSS9 | Level Not Descending            | DEDB SSA Handler for GET and INSERT                    |
| NOTN     | DBFMCSS9 | Segment Name Not Found          | DEDB SSA Handler for GET and INSERT                    |
| NOSG     | DBFMCSS9 | No Segment Name Found           | DEDB SSA Handler for GET and INSERT                    |
| ENAC     | DBFMCSS9 | Hierarchy Error in Segment Name | DEDB SSA Handler for GET and INSERT                    |
| SSD9     | DBFMSSD9 | Entry, Exit(Shift)              | DEDB SSA Handler for DELETE                            |
| SAGE     | DBFMSSG9 | Entry,Exit (Shift)              | DEDB SSA Handler for GET                               |
| SAIN     | DBFMSSI9 | Entry,Exit (Shift)              | DEDB SSA Handler for INSERT                            |
| SSP9     | DBFMSSP9 | Entry,Exit (Shift)              | DEDB SSA Handler for POS                               |
| SSR9     | DBFMSSR9 | Entry,Exit (Shift)              | DEDB SSA Handler for REPLACE                           |
| MSTP     | DBFMSTP0 | Entry                           | DEDB I/O substitute routine when ADS is closing/closed |
| NSTP     | DBFMSTP0 | Exit                            | DEDB I/O substitute routine when ADS is closing/closed |
| SVC9     | DBFMSVC9 | Entry, Exit(Shift)              | DEDB set V Command as U command in MLTE                |
| MUHE     | DBFMUHE0 | Entry                           | DEDB Update Log Entry in DMHR                          |
| NUHE     | DBFMUHE0 | Exit                            | DEDB Update Log Entry in DMHR                          |
| MUH1     | DBFMUHE1 | Entry, Exit(Shift)              | DEDB Front End/Back End Elimination                    |
| MUPB     | DBFMUPB0 | Entry                           | DEDB View=MSDB Update Buffer handler                   |
| XUPB     | DBFMUPB0 | Exit                            | DEDB View=MSDB Update Buffer handler                   |
| MVfy     | DBFMVfy0 | Entry                           | DEDB FLD Call Verify Processor                         |
| XVfy     | DBFMVfy0 | Exit                            | DEDB FLD Call Verify Processor                         |
| VSNA     | DBFMVSN9 | Entry, Exit(Shift)              | DEDB Call Handler Verify Segment Name                  |
| FOND     | DBFMVSN9 | Segment Name Found              | DEDB Call Handler Verify Segment Name                  |
| NOTM     | DBFNOTM0 | Entry                           | Intersystem NOTIFY processor                           |
| EOTM     | DBFNOTM0 | Exit                            | Intersystem NOTIFY processor                           |
| PDNA     | DBFPDNA0 | Entry                           | DEDB SETR Positioning                                  |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                      | Comments                                   |
|----------|----------|----------------------------------|--------------------------------------------|
| PGA5     | DBFPDNA0 | Exit                             | DEDB SETR Positioning                      |
| PENQ     | DBFPENQ0 | Entry                            | DEDB UOW Resource Enqueue                  |
| NENQ     | DBFPENQ0 | Exit                             | DEDB UOW Resource Enqueue                  |
| PFDS     | DBFPFDS0 | Entry                            | DEDB Unallocate, Unchain, and release ADSC |
| PGAB     | DBFPGAB0 | Entry                            | DEDB Get Private Buffer or Buffers         |
| NGAB     | DBFPGAB0 | Exit                             | DEDB Get Private Buffer or Buffers         |
| PGAP     | DBFPGAP0 | Entry                            | DEDB HSSP Positioning                      |
| PGAE     | DBFPGAP0 | Exit                             | DEDB HSSP Positioning                      |
| PGA1     | DBFPGAP0 | New AREA                         | DEDB HSSP Positioning                      |
| PGA2     | DBFPGAP0 | Previous AREA still active       | DEDB HSSP Positioning                      |
| PGA3     | DBFPGAP0 | Same AREA                        | DEDB HSSP Positioning                      |
| PGDS     | DBFPGDS0 | Entry                            | DEDB Allocate and Chain ADSC               |
| PHST     | DBFPHST0 | Entry                            | DEDB HSSP/Utility Process Termination      |
| PICS     | DBFPICS0 | Entry                            | DEDB HSSP Image Copy Process Setup         |
| NICS     | DBFPICS0 | Exit                             | DEDB HSSP Image Copy Process Setup         |
| PIOS     | DBFPIOS0 | Entry                            | DEDB HSSP Image Copy I/O Routine           |
| IOSH     | DBFPIOS0 | Imac_IC_cursor GT req uow 1st CI | DEDB HSSP Image Copy I/O Routine           |
| IOSL     | DBFPIOS0 | Imac_IC_cursor LT req uow 1st CI | DEDB H DEDB HSSP Image Copy I/O Routine    |
| IOSE     | DBFPIOS0 | Imac_IC_cursor EQ req uow 1st CI | DEDB HSSP Image Copy I/O Routine           |
| NIOS     | DBFPIOS0 | Exit                             | DEDB HSSP Image Copy I/O Routine           |
| PRAB     | DBFPRAB0 | Entry                            | DEDB Release Current UOW Resources         |
| NRAB     | DBFPRAB0 | Exit                             | DEDB Release Current UOW Resources         |
| PSET     | DBFPSET0 | Entry, Exit(Shift)               | DEDB HSSP Process Setup                    |
| PULI     | DBFPULIO | Entry                            | DEDB UOW Lock Mode Initiation              |
| NULI     | DBFPULIO | Exit                             | DEDB UOW Lock Mode Initiation              |
| PUL1     | DBFPULIO | Wait for CI locks to be released | DEDB UOW Lock Mode Initiation              |
| PUXC     | DBFPUXC0 | Entry                            | DEDB UOW Resource Handler                  |
| NUXC     | DBFPUXC0 | Exit                             | DEDB UOW Resource Handler                  |
| LUXC     | DBFPUXC0 | Lock Subroutine Entry            | DEDB UOW Resource Handler                  |
| PUXR     | DBFPUXR0 | Entry                            | DEDB Release UXRBS                         |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                       | Comments                                  |
|----------|----------|-----------------------------------|-------------------------------------------|
| NUXR     | DBFPUXR0 | Exit                              | DEDB Release UXRBS                        |
| BSBP     | DBFSBP10 | Entry                             | MSDB Syncpoint Phase I                    |
| RSBP     | DBFSBP10 | Exit                              | MSDB Syncpoint Phase I                    |
| BACC     | DBFSBP10 | Use MSDB data for operation       | MSDB Syncpoint Phase I                    |
| RACC     | DBFSBP10 | Use Record data for operation     | MSDB Syncpoint Phase I                    |
| CACC     | DBFSBP10 | Trace Segment to be processed     | MSDB Syncpoint Phase I                    |
| DACC     | DBFSBP10 | After move to EPST work area      | MSDB Syncpoint Phase I                    |
| EACC     | DBFSBP10 | Move MSDB Data                    | MSDB Syncpoint Phase I                    |
| FACC     | DBFSBP10 | Move MSDB Data                    | MSDB Syncpoint Phase I                    |
| BMSG     | DBFSBP10 | Setup Arithmetic Overflow message | MSDB Syncpoint Phase I                    |
| SDEQ     | DBFSDEQ0 | Entry                             | FP Resource Dequeue                       |
| TDEQ     | DBFSDEQ0 | Exit                              | FP Resource Dequeue                       |
| UOWX     | DBFSDEQ0 | Change UOW Lock Ownership         | FP Resource Dequeue                       |
| SFLD     | DBFSFLD0 | Entry                             | DEDB Syncpoint Phase I FLD Call           |
| RSFL     | DBFSFLD0 | Exit                              | DEDB Syncpoint Phase I FLD Call           |
| SGAB     | DBFSGAB0 | Entry                             | DEDB Get Buffer from Shared Pool          |
| ZGAB     | DBFSGAB0 | Exit                              | DEDB Get Buffer from Shared Pool          |
| SHQD     | DBFSHDQ0 | Entry                             | DEDB HSSP Resource Dequeue Phase II       |
| SHDX     | DBFSHDQ0 | Exit                              | DEDB HSSP Resource Dequeue Phase II       |
| HPRE     | DBFSHDQ0 | Trace DMAC                        | DEDB HSSP Resource Dequeue Phase II       |
| HPR1     | DBFSHDQ0 | Application got GC status         | DEDB HSSP Resource Dequeue Phase II       |
| HPR3     | DBFSHDQ0 | Application did not get GC status | DEDB HSSP Resource Dequeue Phase II       |
| HPRA     | DBFSHDQ0 | Sync Abort Flow                   | DEDB HSSP Resource Dequeue Phase II       |
| SIC1     | DBFSIC10 | Entry DBFSIC10                    | DEDB HSSP Image Copy Phase I and Phase II |
| NIC1     | DBFSIC10 | Exit DBFSIC10                     | DEDB HSSP Image Copy Phase I and Phase II |
| SIC2     | DBFSIC10 | Entry DBFSIC20                    | DEDB HSSP Image Copy Phase I and Phase II |
| NIC2     | DBFSIC10 | Exit DBFSIC10                     | DEDB HSSP Image Copy Phase I and Phase II |
| SICC     | DBFSIC10 | Good Sync, enqueue DMHRSET        | DEDB HSSP Image Copy Phase I and Phase II |



Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                     | Comments                                     |
|----------|----------|---------------------------------|----------------------------------------------|
| SICE     | DBFSIC10 | Last UOW, enqueue<br>TERM AWE   | DEDB HSSP Image Copy Phase I and Phase II    |
| SLGE     | DBFSLGE0 | Entry, Exit(Shift)              | DEDB Sync Log Exit                           |
| SLGE2S   | DBFSLGE2 | Entry                           | DEDB Sync Log Exit for Segment Level Locking |
| SLGE20E  | DBFSLGE2 | Exit                            | DEDB Sync Log Exit for Segment Level Locking |
| SLG2     | DBFSLG20 | Entry, Exit(Shift)              | DEDB Sync/Abort Log Processor                |
| SLOG     | DBFSLOG0 | Entry,Bad Sync(Shift)           | FP Log Processor                             |
| TLOG     | DBFSLOG0 | Exit                            | FP Log Processor                             |
| MP10     | DBFSMP10 | Entry                           | DEDB SDEP Syncpoint Phase I                  |
| SYPB     | DBFSMP10 | New current SDEP<br>Buffer      | DEDB SDEP Syncpoint Phase I                  |
| MP11     | DBFSMP10 | Trace #PA Cis,<br>#required Cis | DEDB SDEP Syncpoint Phase I                  |
| MP12     | DBFSMP10 | Trace needed CI<br>Space        | DEDB SDEP Syncpoint Phase I                  |
| MP13     | DBFSMP10 | Trace new CI space              | DEDB SDEP Syncpoint Phase I                  |
| NP10     | DBFSMP10 | Exit                            | DEDB SDEP Syncpoint Phase I                  |
| SPIX     | DBFSPIX0 | Entry                           | DEDB Process unused XCRB/DMHR at Sync        |
| XPIX     | DBFSPIX0 | Exit                            | DEDB Process unused XCRB/DMHR at Sync        |
| BSY0     | DBFSYN00 | Entry                           | Pure FP Sync Point Controller                |
| SYN1     | DBFSYN10 | Entry                           | FP Syncpoint Phase I Controller              |
| TYN1     | DBFSYN10 | Exit                            | FP Syncpoint Phase I Controller              |
| SYN2     | DBFSYN20 | Entry, Entry 2nd Call           | FP Syncpoint Phase II Controller             |
| TYN2     | DBFSYN20 | Exit                            | FP Syncpoint Phase II Controller             |
| SYP2     | DBFSYP20 | Entry                           | FP Syncpoint Phase II                        |
| TYP2     | DBFSYP20 | Exit                            | FP Syncpoint Phase II                        |
| SYPB     | DBFSYP20 | New current SDEP<br>Buffer      | FP Syncpoint Phase II                        |
| AFCE     | DBFTAFC9 | Entry                           | Analyze FPTCNTRL control cards               |
| AFCX     | DBFTAFC9 | Exit                            | Analyze FPTCNTRL control cards               |
| ATCE     | DBFTATC9 | Entry                           | Analyze Trace Calls                          |
| TON0     | DBFTATC9 | Trace ON                        | Analyze Trace Calls                          |
| TOFF     | DBFTATC9 | Trace OFF                       | Analyze Trace Calls                          |
| TSEL     | DBFTATC9 | TOM Table built                 | Analyze Trace Calls                          |
| TDAT     | DBFTATC9 | Deactivate Trace                | Analyze Trace Calls                          |
| TACT     | DBFTATC9 | Activate Trace                  | Analyze Trace Calls                          |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                  | Comments                                             |
|----------|----------|------------------------------|------------------------------------------------------|
| ATCX     | DBFTATC9 | Exit without error           | Analyze Trace Calls                                  |
| ATCY     | DBFTATC9 | Error Exit                   | Analyze Trace Calls                                  |
| BLTE     | DBFTBLT9 | Entry                        | Build TOM Table Structure                            |
| BLTX     | DBFTBLT9 | Exit                         | Build TOM Table Structure                            |
| BMIE     | DBFTBMI9 | Entry                        | Build Trace Message In I/O Area                      |
| BMIX     | DBFTBMI9 | Exit                         | Build Trace Message In I/O Area                      |
| COTE     | DBFTCOT9 | Entry                        | Construct Trace Option Table                         |
| COT1     | DBFTCOT9 | Trace before<br>IMODULE LOAD | Construct Trace Option Table                         |
| COT2     | DBFTCOT9 | After call to<br>DBFTBLT9    | Construct Trace Option Table                         |
| ILAR     | DBFTCOT9 | After GETMAIN                | Construct Trace Option Table                         |
| COT3     | DBFTCOT9 | After GETMAIN                | Construct Trace Option Table                         |
| COT4     | DBFTCOT9 | Delete TOM                   | Construct Trace Option Table                         |
| COTX     | DBFTCOT9 | Exit without error           | Construct Trace Option Table                         |
| COTY     | DBFTCOT9 | Error Exit                   | Construct Trace Option Table                         |
| ABN2     | DBFTDEB9 | Trace without SDWA           | Provide Debugging Information for Abending<br>Module |
| ABN1     | DBFTDEB9 | Trace with SDWA              | Provide Debugging Information for Abending<br>Module |
| FTOE     | DBFTDEB9 | Entry                        | Free Previous TOM                                    |
| FTOX     | DBFTDEB9 | Exit                         | Free Previous TOM                                    |
| TRAF     | DBFTIR1S | Trace OFF                    | DBFIRC10 Connection to FP Trace                      |
| TRAN     | DBFTIR1S | Trace ON                     | DBFIRC10 Connection to FP Trace                      |
| SIEE     | DBFTSIE9 | Entry                        | Setup Initial Environment for FP Trace               |
| SIEX     | DBFTSIE9 | Exit                         | Setup Initial Environment for FP Trace               |
| STS9     | DBFTSTS9 | Entry                        | Set Trace Suppress Flag                              |
| STSX     | DBFTSTS9 | Exit                         | Set Trace Suppress Flag                              |
| VIAE     | DBFTVIA9 | Entry                        | Verify I/O Area of Trace Call                        |
| TCAL     | DBFTVIA9 | Trace I/O Area               | Verify I/O Area of Trace Call                        |
| TC01     | DBFTVIA9 | Call is TON or TOFF          | Verify I/O Area of Trace Call                        |
| TC02     | DBFTVIA9 | Call is TSEL                 | Verify I/O Area of Trace Call                        |
| TC03     | DBFTVIA9 | Trace 1st ID in I/O<br>Area  | Verify I/O Area of Trace Call                        |
| VIAX     | DBFTVIA9 | Exit without error           | Verify I/O Area of Trace Call                        |
| VIAY     | DBFTVIA9 | Error Exit                   | Verify I/O Area of Trace Call                        |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                        | Comments                                       |
|----------|----------|------------------------------------|------------------------------------------------|
| 24BE     | DBFT24B0 | Entry                              | Trace Get/Put Routines in 24-bit mode          |
| 24BX     | DBFT24B0 | Exit                               | Trace Get/Put Routines in 24-bit mode          |
| UHAC     | DBFUHAC7 | Entry                              | DEDB HSRE Access segment in non reorganized CI |
| UHAX     | DBFUHAC7 | Exit                               | DEDB HSRE Access segment in non reorganized CI |
| UHAR     | DBFUHAR0 | Entry                              | DEDB HS Utility Async Read-Ahead               |
| HAR2     | DBFUHAR0 | Wait for inflight async read ahead | DEDB HS Utility Async Read-Ahead               |
| HAR1     | DBFUHAR0 | Setup SRB for async read ahead     | DEDB HS Utility Async Read-Ahead               |
| UHAX     | DBFUHAR0 | Exit                               | DEDB HS Utility Async Read-Ahead               |
| PCH0     | DBFUHAR0 | Entry to routine UHARPCH0          | DEDB HS Utility Async Read-Ahead               |
| PCH1     | DBFUHAR0 | Found non-HSSP XCRB in UOW         | DEDB HS Utility Async Read-Ahead               |
| PCH2     | DBFUHAR0 | XCRB has DMHR                      | DEDB HS Utility Async Read-Ahead               |
| PCH3     | DBFUHAR0 | Data copied to HSSP buffer         | DEDB HS Utility Async Read-Ahead               |
| PCH4     | DBFUHAR0 | Release DMHR and XCRB              | DEDB HS Utility Async Read-Ahead               |
| PCHX     | DBFUHAR0 | Exit from routine UHARPCH0         | DEDB HS Utility Async Read-Ahead               |
| UHDA     | DBFUHDA0 | Entry                              | DEDB HSRE Process Alloc/Dealloc of IOVF Cis    |
| UHDX     | DBFUHDA0 | Exit                               | DEDB HSRE Process Alloc/Dealloc of IOVF Cis    |
| UHDS     | DBFUHDS0 | Entry                              | DMAC Sync                                      |
| UHDX     | DBFUHDS0 | Exit                               | DMAC Sync                                      |
| UHGS     | DBFUHGS7 | Entry                              | DEDB HSRE Get Space to Copy Segment            |
| UHGX     | DBFUHGS7 | Exit                               | DEDB HSRE Get Space to Copy Segment            |
| UHIO     | DBFUHIO0 | Entry                              | DEDB HSRE Read a specified CI                  |
| UHIX     | DBFUHIX0 | Exit                               | DEDB HSRE Read a specified CI                  |
| UHPR     | DBFUHPR7 | Entry                              | DEDB HSRE Process Root Chain of RAP CI         |
| UHPX     | DBFUHPR7 | Exit                               | DEDB HSRE Process Root Chain of RAP CI         |
| UHRD     | DBFUHRD7 | Entry                              | DEDB HSRE Read Database Record                 |
| UHRX     | DBFUHRD7 | Exit                               | DEDB HSRE Read Database Record                 |
| UHRE     | DBFUHRE0 | Entry                              | DEDB HSRE UOW Reorg Mainline                   |
| UHRX     | DBFUHRE0 | Exit                               | DEDB HSRE UOW Reorg Mainline                   |

Table 276. Fast Path trace entries (continued)

| Trace ID | Module   | Trace point                        | Comments                                    |
|----------|----------|------------------------------------|---------------------------------------------|
| UHSR     | DBFUHSR0 | Entry                              | DEDB HSRE Mainline                          |
| UHSX     | DBFUHSR0 | Exit                               | DEDB HSRE Mainline                          |
| UHSS     | DBFUHSS0 | Entry                              | DEDB High Speed Utility Services            |
| UHS1     | DBFUHSS0 | Wait for inflight async read ahead | DEDB High Speed Utility Services            |
| NHSS     | DBFUHSS0 | Exit                               | DEDB High Speed Utility Services            |
| UHSI     | DBFUHSS0 | HSSP Image Copy Termination        | DEDB High Speed Utility Services            |
| UMAF     | DBFUMAF0 | Entry                              | DEDB Utility Page Fix Services              |
| VMAF     | DBFUMAF0 | Exit                               | DEDB Utility Page Fix Services              |
| UMAI     | DBFUMAI0 | Entry                              | DEDB Utility I/O Services                   |
| ENQR     | DBFUMAI0 | Test for SDEP CI Lock              | DEDB Utility I/O Services                   |
| VMAI     | DBFUMAI0 | Exit                               | DEDB Utility I/O Services                   |
| UMAL     | DBFUMAL0 | Entry                              | DEDB Utility Logging                        |
| VMAL     | DBFUMAL0 | Exit                               | DEDB Utility Logging                        |
| UMAN     | DBFUMAN0 | Entry                              | DEDB Utility Services                       |
| VMAN     | DBFUMAN0 | Exit                               | DEDB Utility Services                       |
| UMAV     | DBFUMAV0 | Entry                              | DEDB Utility Set ADS Available              |
| VMAC     | DBFUMAV0 | Exit                               | DEDB Utility Set ADS Available              |
| UMDS     | DBFUMDS0 | Entry                              | DEDB Utility DMAC Sync (CONNECT/DISCONNECT) |
| VMDS     | DBFUMDS0 | Exit                               | DEDB Utility DMAC Sync (CONNECT/DISCONNECT) |
| UMFT     | DBFUMFT0 | Entry                              | DEDB ADS Format                             |
| VMFT     | DBFUMFT0 | Exit                               | DEDB ADS Format                             |
| UMMT     | DBFUMMT0 | Entry                              | DEDB Utility MTO Message Services           |
| UNMT     | DBFUMMT0 | Exit                               | DEDB Utility MTO Message Services           |
| UMNO     | DBFUMNO0 | Entry                              | DEDB Utility Notify Partners to Open ADS    |
| VMNO     | DBFUMNO0 | Exit                               | DEDB Utility Notify Partners to Open ADS    |
| VSCL     | DBFVSCL0 | Entry                              | DEDB VSO Area Close                         |
| VSCE     | DBFVSCL0 | Exit                               | DEDB VSO Area Close                         |
| VSOP     | DBFVSOP0 | Entry                              | DEDB VSO Area Open                          |
| VSOE     | DBFVSOP0 | Exit                               | DEDB VSO Area Open                          |
| XPIX     | DBFXPIX0 | Entry                              | Free a chain of XCRBs/UXRBs                 |
| NPIX     | DBFXPIX0 | Exit                               | Free a chain of XCRBs/UXRBs                 |

## Type-2 trace tables

You can activate IMS type-2 trace tables at IMS startup or while IMS is active. Unlike type-1 trace tables, type-2 trace tables can be updated dynamically using the **UPDATE TRACE** command while IMS is up, and they can be queried to gather diagnostic information.

The settings for type-2 trace tables are specified in the DFSDFxxx PROCLIB member by using the TRCLEV statement. The size of each type-2 trace table can be specified by the user, whereas the size of type-1 trace tables is a fixed value determined by IMS. Type-2 trace tables can be used in the same environments as type-1 trace tables.

For more information about the differences between type-1 and type-2 trace tables, see [IMS Trace Facility \(System Administration\)](#).

Type-2 trace records are written to one or more of the trace tables that are shown in the following table:

| <i>Table 277. Type-2 trace tables for type-2 trace records</i> |                                  |
|----------------------------------------------------------------|----------------------------------|
| <b>Table type</b>                                              | <b>Table description</b>         |
| DDL                                                            | Traces DDL events within IMS.    |
| ERR                                                            | Traces error events within IMS   |
| TRCE                                                           | Traces IMS trace services events |
| USRX                                                           | Traces IMS User Exit services    |

### **Related concepts**

[IMS Trace Facility \(System Administration\)](#)

### **Related tasks**

[Setting up type-2 trace tables \(System Definition\)](#)

### **Related reference**

[QUERY TRACE command \(Commands\)](#)

[UPDATE TRACE command \(Commands\)](#)

## Type-2 trace records

You can analyze type-2 trace records to gather diagnostic information.

Type-2 trace records are mapped by a macro that follows the naming convention of DFSTxxx macro, where xxx represents the type-2 trace table name as shown in the following table:

| <i>Table 278. Type-2 trace record mapping macros</i> |                    |
|------------------------------------------------------|--------------------|
| <b>Trace macro name</b>                              | <b>Description</b> |
| DFSTDDL                                              | DDL trace records  |

### **Related tasks**

[Setting up type-2 trace tables \(System Definition\)](#)

## IMS shutdown trace table

When IMS begins shutdown processing, IMS populates a trace table for the shutdown activity. The shutdown trace table is included in a dump of the IMS control region, and can help you determine which module is preventing IMS shutdown from completing.

The shutdown trace table is written to memory and contains 64 one-byte entries.

You can find the IMS shutdown trace table in a formatted dump from the pointer to DGA\_SDTT in the Diagnostic Anchor Block (DGA), which is pointed to by SCDDGA in the System Contents Directory (SCD) control block. Each entry is one byte and contains the ID of the module entry or exit point. The table

structure is defined in the DFSSDTT macro. Entries are written to the shutdown trace table in the same sequence in which they arrived. When the end of the table is reached, new entries are wrapped to the start of the table and overwrite the oldest existing entries.

The following table shows the trace value for each module entry or exit point. Unused shutdown trace table entries contain zeroes.

*Table 279. Trace-to-code-module-name cross reference for the IMS shutdown trace table*

| <b>Module name</b> | <b>Entry</b> | <b>Exit: RC=0</b> |
|--------------------|--------------|-------------------|
| DBFTERM0           | X'40'        | X'80'             |
| DBFTERM1(EP)       | X'41'        | X'81'             |
| DFSCPCP0           | X'42'        | X'82'             |
| DFSCST00           | X'43'        | X'83'             |
| DFSDLOC0           | X'44'        | X'84'             |
| DFSICIO0           | X'45'        | X'85'             |
| DFSICLX0           | X'46'        | X'86'             |
| DFSICL20           | X'47'        | X'87'             |
| DFSIPCP0           | X'48'        | X'88'             |
| DFSRCP00           | X'49'        | X'89'             |
| DFSRCRT0           | X'4A'        | X'8A'             |
| DFSSDL40           | X'4B'        | X'8B'             |
| DFSTERM0           | X'4C'        | X'8C'             |
| DFSTRM00           | X'4D'        | X'8D'             |
| UNLOCK00           | X'4E'        | X'8E'             |
| ESSSHUT0           | X'4F'        | X'8F'             |
| DFSIPCP1           | X'50'        | X'90'             |
| DFSIPCP2           | X'51'        | X'91'             |
| DFSIPCP3           | X'52'        | X'92'             |
| DFSICM30           | X'53'        | X'93'             |
| DFSQC010           | X'54'        | X'94'             |
| OTMAPHA1           | X'55'        | X'95'             |
| OTMAPHA2           | X'56'        | X'96'             |
| OTMAPHA3           | X'57'        | X'97'             |
| DFS6ECT0           | X'58'        | X'98'             |

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