Tivoli® System Automation for z/OS

IBM

Version 3 Release 1

IMS Automation Programmer's Reference and Operator's Guide

Tivoli® System Automation for z/OS

Version 3 Release 1

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Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page ix.

Third Edition (July 2006)

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VTAM	z/OS	

About This Book

This book describes how to customize and operate IMS™ Automation. IMS Automation is a feature of IBM® Tivoli® System Automation for z/OS® (SA z/OS) that provides a simple and consistent way to monitor and control all of the IMS regions, both local and remote, within your organization. This automation feature automates, simplifies, and standardizes console operations and the management of component, application, and production related tasks.

Who Should Use This Book

This book is intended for two kinds of users or user groups:

- System programmers, system designers, and application designers who will automate IMS using IMS Automation.

  For these users, all three parts of the book will be of interest.

  Installing and customizing IMS Automation requires a programmer's understanding of NetView®, IMS, SA z/OS, and IMS Automation, because most of the definitions take place in these programs. Also, you will modify JCL, command lists, and programs for some of the automation functions

- Operators and administrators who manage and monitor IMS subsystems.

  These users will mainly need part 1 and part 3.

  For operators, a working knowledge of IMS will be assumed.

What's in This Book

This book contains the following:

Part 1, "Introducing IMS Automation"
Explains some main concepts of SA z/OS and describes the special functions of IMS Automation.

Part 2, "Customizing IMS Automation"
Describes the customization of IMS Automation and contains reference sections for MESSAGES policy items and for the programming interface.

Part 3, "Using IMS Automation"
Describes the operator interface of IMS Automation.

Related Publications

The System Automation for z/OS Library

The following table shows the information units in the System Automation for z/OS library:

Table 1. System Automation for z/OS Library

Title	Order Number
IBM Tivoli System Automation for z/OS Planning and Installation	SC33-8261
IBM Tivoli System Automation for z/OS Customizing and Programming	SC33-8260
IBM Tivoli System Automation for z/OS Defining Automation Policy	SC33-8262
IBM Tivoli System Automation for z/OS User's Guide	SC33-8263
IBM Tivoli System Automation for z/OS Messages and Codes	SC33-8264
IBM Tivoli System Automation for z/OS Operator's Commands	SC33-8265
IBM Tivoli System Automation for z/OS Programmer's Reference	SC33-8266
IBM Tivoli System Automation for z/OS CICS Automation Programmer's Reference and Operator's Guide	SC33-8267
IBM Tivoli System Automation for z/OS IMS Automation Programmer's Reference and Operator's Guide	SC33-8268
IBM Tivoli System Automation for z/OS TWS Automation Programmer's Reference and Operator's Guide	SC23-8269
IBM Tivoli System Automation for z/OS End-to-End Automation Adapter	SC33-8271

The System Automation for z/OS books are also available on CD-ROM as part of the following collection kit:

IBM Online Library z/OS Software Products Collection (SK3T-4270)

SA z/OS Home Page

For the latest news on SA z/OS, visit the SA z/OS home page at http://www.ibm.com/servers/eserver/zseries/software/sa

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Related Product Information

You can find books in related product libraries that may be useful for support of the SA z/OS base program by visiting the z/OS Internet Library at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

Using LookAt to look up message explanations

LookAt is an online facility that lets you look up explanations for most of the IBM messages you encounter, as well as for some system abends and codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can use LookAt from these locations to find IBM message explanations for z/OS elements and features, z/VM®, VSE/ESA™, and Clusters for AIX® and Linux™:

- The Internet. You can access IBM message explanations directly from the LookAt Web site at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/.
- Your z/OS TSO/E host system. You can install code on your z/OS or z/OS.e systems to access IBM message explanations using LookAt from a TSO/E command line (for example: TSO/E prompt, ISPF, or z/OS UNIX® System Services).
- Your Microsoft® Windows® workstation. You can install LookAt directly from the _z/OS Collection_ (SK3T-4269) or the _z/OS and Software Products DVD Collection_

(SK3T4271) and use it from the resulting Windows graphical user interface (GUI). The command prompt (also known as the DOS > command line) version can still be used from the directory in which you install the Windows version of LookAt.

- Your wireless handheld device. You can use the LookAt Mobile Edition from http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookatm.html with a handheld device that has wireless access and an Internet browser (for example: Internet Explorer for Pocket PCs, Blazer or Eudora for Palm OS, or Opera for Linux handheld devices).

You can obtain code to install LookAt on your host system or Microsoft Windows workstation from:

- A CD-ROM in the *z/OS Collection* (SK3T-4269).
- The *z/OS and Software Products DVD Collection* (SK3T4271).
- The LookAt Web site (click **Download** and then select the platform, release, collection, and location that suit your needs). More information is available in the LOOKAT.ME files available during the download process.

Part 1. Introducing IMS Automation

This part describes principal concepts of SA z/OS, including some NetView related information, and gives an overview of the additional facilities offered by IMS Automation

Chapter 1. Special Functions of IMS Automation

IMS Automation is integrated into SA z/OS. Thus, IMS regions must be defined in the policy database as subsystems by linking IMS applications to systems in order to be available to IMS Automation. Triggers and service periods for IMS regions are also defined as for any other application. But IMS Automation also offers some special facilities.

Recovery of Application Components

You can automate transaction, program, OLDS, and MSC link recovery globally and for individual components. This is achieved by combining basic functions of the product with IMS-specific policy items and several IMS-specific reserved MESSAGES/USER DATA keywords.

Program-to-Program Interface

NetView's program-to-program interface (PPI) provides the ability to communicate between a NetView application and other address spaces on the same host, such as IMS. The PPI enables NetView automation to include cooperative execution of commands in IMS and command processors in NetView.

IMS Automation *optionally* uses the NetView PPI to send IMS commands to IMS and to receive the command responses from IMS. This is done via an IMS REXX adapter BMP, a NetView PPI receiver task (EVINTASK), and a REXX command routine (EVISNCCI).

Note: This PPI support is no longer required and is only supplied for compatibility with previously releases. Customers who do not use the REXX command routine (EVISNCCI) do not need to enable this facility.

FDR Environment

This section describes automation functions applicable to FDR-enabled IMS environments.

Note: FDR provides superior, sysplex aware automated recovery within IMS. It is the recommended solution for high availability of IMS applications.

The automation functions provide cross-system support for IMS and FDR startup and shutdown.

Recovery Capability: FDR IMS Automation implementation will support automatic response to the IMS DFS4167A WTOR message when the IMS I/O prevention completed message AVM006I is received during recovery processing.

Functional Overview

The following sections provide an overview of the FDR region startup, shutdown and recovery functions provided by IMS Automation.

Startup Overview

It is recommended to automate startup by defining relationships as described in "Defining an FDR Environment" on page 17.

Recovery Overview

IMS Automation does not provide any action related to FDR recovery.

Assume that IMS is running on system *SYS1* and FDR is running on system *SYS2*. The sequence of events during IMS Control Region failure and FDR recovery is as follows:

1. When IMS on system *SYS1* abends, WTOR message DFS4167A is issued by the FDR region on *SYS2* indicating that it is waiting for the failing IMS region to complete I/O Prevention.
2. When the failing IMS on *SYS1* completes I/O Prevention, message AVM006E is issued by the Availability Manager on *SYS1*.
3. IMS FDR automatically detects that the AVM006E message has been issued and that I/O Prevention is complete and cancels message DFS4167A. This allows FDR on *SYS2* to commence recovery processing.

If, for any reason, message AVM006E is not issued and I/O Prevention does not complete, then message DFS4167A remains outstanding and manual operator intervention is required.

Shutdown Overview

The FDR address space will automatically terminate after recovery is complete. The FDR address space will also terminate automatically whenever the IMS Control region is shut down.

IMS Message Processing

SA z/OS can only automate messages that are issued via WTO. Most IMS system messages that are important are WTO'd, However, there are many IMS messages that are only logged internally. Some of these messages may be useful in automation situations. To enable SA z/OS to process these messages, exits are installed to WTO messages that would not be WTO'd by IMS. In addition, user code might produce messages that are written to IMS. Some of these messages might be of interest in automation situations.

SA z/OS installs an exit to WTO these messages. SA z/OS installs an exit for the AOE Type 2 exit of IMS Control regions.

The messages that are WTO'd from this exit are defined in the MESSAGES/USER DATA policy for the subsystem or the subsystem Class. See "Using the IMS Automation Message Policy" on page 15 for details.

Part 2. Customizing IMS Automation

This part describes the steps that are necessary to customize and set up IMS Automation. Furthermore, it contains reference sections for IMS-specific MESSAGES/USER DATA keywords and for common routines which request information or perform tasks associated with IMS Automation.

Important: IMS Automation 2.2 only supports IMS V6 and higher.

Chapter 2. Customizing IMS Automation

This section explains how to customize NetView, IMS and SA z/OS for IMS Automation. The customization process mainly consists of defining the policy objects that are necessary for IMS Automation in the SA z/OS policy database.

IMS Automation Definitions

You customize IMS Automation for your specific installation by modifying the policy database in the customization dialog. To show you what kind of definitions you need in your policy database, SA z/OS comes with an add-on sample policy database named *IMS, as shown in Figure 1.

*Figure 1. *IMS Add-On Policy*

See *IBM Tivoli System Automation for z/OS Defining Automation Policy* for how to:

- Import the add-on sample *IMS
- Modify the definitions that this import has added to your policy database

Step 1: Provide Basic IMS Automation Common Policy Definitions

Substep 1a: Define the Automation Operators

The *IMS add-on sample policy database supplies all automation operator definitions that are required for IMS automation as well as some that are optional. They all reside in the IMS_AUTO_OPS policy object in entry type AOP. The ones that are required are the following:

Automated Function	Operator ID	Message Classes
IMSMSTR	AUTIMS	EVI*

Automated Function	Operator ID	Message Classes
IMSWATCH	AUTSURV	—
IMSPPI	AUTIPPI	—

> **Note:** Make sure that these operator IDs are defined in the DSIOPF member in the DSIPARM data set of NetView.

Substep 1b: Define State/Action Tables

Define sets of State/Action Tables in the ISA entry type as described in "How to Set Up the State/Action Tables" on page 27.

> **Note:**
> To find the ISA entry type, start by selecting the PRD entry type on the Entry Type Selection panel. This takes you to the Entry type selections for Product Automation shown in Figure 2, where the ISA entry type resides.

```
   MENU  HELP
  ----------------------------------------------------------------------------
  AOFGEPOM         Entry type selections for Product Automation
  Option ===> _____

   IMS components
   20 ISA     IMS State/Action
   21 ISF     IMS Status file
   22 IRN     IMS resource name

   OPC components
   30 OEN     OPC System details
   31 OCS     Controller details
   32 OSR     Special resources
   33 ODM     Workstation domainID

   CICS components
   40 CSA     CICS State/Action
   41 CCN     CICS Link
   42 CVP     Monitoring period
```

Figure 2. Entry type selections for Product Automation Panel (to be found via entry type PRD)

Step 2: Define IMS Regions

All IMS regions must be defined to SA z/OS as APPLICATION objects in the customization dialog; for these objects, the **Application Type** field must be set to IMS.

The *IMS add-on sample policy database provides you with a number of sample classes and instances of entry type APL that model IMS regions. Copy and modify them to tailor them to your needs.

- The names of the APL classes in *IMS have the prefix CLASS_IMS_
- The names of the APL instances in *IMS have the prefix IMS

Applications of type IMS have the following IMS-specific policy items:

- IMS CONTROL

This item must be defined for all region types. For details see *IBM Tivoli System Automation for z/OS Defining Automation Policy.*

- RESOURCE THRESHOLDS

  This item specifies the thresholds for recovery of application components. For details see "Automating Recovery for Application Components" on page 23.

- STATE ACTION TABLE

  This item serves to link an application to a set of state/action tables that you created in "Substep 1b: Define State/Action Tables" on page 8. The State/Action Tables are used for component recovery. For more details see "How to Set Up the State/Action Tables" on page 27.

The following subsections inform you about special customization aspects for different region types.

Substep 1: Code the Entries for Control Regions

When defining control regions, observe the following points:

- You must code thresholds in the standard THRESHOLDS policy item.
- If you will use service periods or triggers, link these to the control region under the SERVICE PERIOD or TRIGGER policy item.

In addition, specify the MESSAGES/USER DATA keywords shown in Table 2. For more information on IMS-specific MESSAGES/USER DATA keywords, see Chapter 4, "MESSAGES/USER DATA Entries for IMS Automation," on page 33.

Table 2. Applicable MESSAGES/USER DATA Keywords for Control Regions

Required	Keyword	Comments	See Page
✔	ABCODEPROG	Respond to BMP Region Abends.	34
✔	ABCODES	Non-XRF abend codes.	36
✔	ABCODETRAN	Transaction Abend Recovery.	37
✔	ACORESTART	Resynchronization on Agent restart	39
	BRO	IMS control regions only. Code to issue the appropriate broadcast message prior to shutdown.	40
	CHE	Issue a Checkpoint Command.	41
✔	CQS0031A	Confirm CQS Restart for Structure.	42
✔	CQS0032A	Respond to CQS Structure Restart.	43
✔	CQS0033A	Respond to Client Takeover Restart.	44
✔	CQSET	Issue Structure Checkpoint at CQS Termination.	45
✔	DFS2142	Respond to Stopped Logical Link Path Message.	46
✔	DFS2161I	Link Stopped by Other System.	47
✔	DFS2169I	Respond to MSC Link Disconnection Message.	48
✔	DFS3258A	No Online Data Sets Available.	49
✔	DFS554A	Respond to Program Abend.	50
✔	DFS810A	IMS control regions only. Code for response to message DFS810A.	53

Required	Keyword	Comments	See Page
✔	DFS989I	DB control regions only. Code for response to message DFS989I.	55
✔	DFS994I	Code for actions after message DFS994I.	57
	HOLDQ	Code to hold BMP initiators.	58
✔	IMSINFO	Display Information.	59
✔	OLDS	Define Recovery Criteria for OLDS.	60
	POSTCHKP	Code to reflect your installation's procedure to issue commands after a shutdown checkpoint has been issued.	63
	PRECHKP	Code to reflect your installation's procedure to issue commands prior to a shutdown checkpoint being issued.	65
✔	RECONS	Set Monitoring Interval for RECONS.	67
	RELEASEQ	Code to release BMP initiators.	69
	RESTARTABORT	Code to reflect desired response to the receipt of messages DFS0618 and DFS166I.	70
✔	SHUTTYPES	None.	72
	SNAPQ	XRF only. Code to reflect your installation's procedure to issue the /SNAPQ command.	74
✔	STOPBMPREGION	IMS control regions only.	75
✔	STOPFPREGION	IMS control regions only.	77
✔	STOPREGION	IMS control regions only.	78
	TCO	None.	80
	TCOMEMBERS	None.	81

Substep 2: Code the Entries for DBRC/DLISAS Regions

When defining DBRC/DLISAS regions, observe the following points:

* Set the **External Startup** and **External Shutdown** fields in the AUTOMATION INFO policy item to ALWAYS.

Substep 3: Code the Entries for FDR Regions

When defining FDR regions, observe the following points:

* Code shutdown commands for the NORM and IMMED phases of the SHUTDOWN policy item.
* For recommendations concerning the dependency relationships for FDR regions, see "Defining an FDR Environment" on page 17.

Substep 4: Code the Entries for CQS Regions

When defining CQS regions, observe the following point:

* Code shutdown commands for the NORM and IMMED phases of the SHUTDOWN policy item.

Substep 5: Code the Entries for Message Regions

When defining message regions, observe the following points:

- If you have set the **External Shutdown** field in the AUTOMATION INFO policy item to NEVER or FINAL, you must code shutdown commands for all three phases of the SHUTDOWN policy item.
- If you have set the **External Startup** field in the AUTOMATION INFO policy item to NEVER or INITIAL, you must code a startup command in the STARTUP policy item.
- Code thresholds in the standard THRESHOLDS policy item.

Step 3: Code the Entries for OLDS

When configuring OLDS recovery, observe the following points:

- Define an entry with the name OLDS in the IMS-specific RESOURCE THRESHOLDS policy item. For details, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

In addition, specify the MESSAGES/USER DATA keywords shown in Table 3.

Table 3. Applicable MESSAGES/USER DATA Keywords for Online Data Sets (OLDS)

Required	Keyword	Comments	See Page
✔	OLDS	Code the names of OLDS to be kept as spares. IMS Automation starts the spares only when the number of available OLDS drops below the minimum needed.	60
✔	DFS3258A	Action to take on last OLDS.	49

Step 4: Code the Entries for MSC Links

When configuring MSC link recovery, observe the following points:

- Define entries with the name MSC (for all links) or MSC.*link_id* (for a single link) in the IMS-specific RESOURCE THRESHOLDS policy item.

In addition, specify the MESSAGES/USER DATA keywords shown in Table 4.

Table 4. Applicable MESSAGES/USER DATA Keywords for MSC Links

Required	Keyword	Comments	See Page
✔	DFS2142	Code this entry to restart a logical link path.	46
✔	DFS2161I	Code this entry to restart a link after it has been stopped by an IMS system.	47
✔	DFS2169I	Code this entry to restart a link after disconnection of a Multiple Systems Coupling (MSC) link between two IMS systems.	48

Step 5: Code the Entries for RECONs Recovery

For RECON recovery, specify the MESSAGES/USER DATA keywords shown in Table 5 on page 12.

Table 5. Applicable MESSAGES/USER DATA Keywords for RECONs

Required	Keyword	Comments	See Page
	RECONS	To turn on active monitoring for RECONs, code this entry. IMS Automation checks for spare RECONs at the interval you specify on the RECONS entry.	67

Step 6: Code the Entries for Transaction and Program Recovery

When configuring transaction or program recovery, observe the following points:

- Define entries with the name TRAN (for all transactions) or TRAN.*trans_id* (for a single transaction), and respectively PROG (for all programs) or PROG.*prog_id* (for a single program) in the IMS-specific RESOURCE THRESHOLDS policy item.

In addition, specify the MESSAGES/USER DATA keywords shown in Table 6.

Table 6. Applicable MESSAGES/USER DATA Keywords for Transaction and Program Recovery

Required	Keyword	Comments	See Page
✔	ABCODEPROG	Code this entry to specify system action in response to program abend codes.	34
✔	ABCODETRAN	Code this entry to specify system action in response to transaction abend codes.	37
✔	DFS554A	Code this entry to restart a transaction and program after an abend.	50

Step 7: Extended IMS Automation Definitions

If you want to customize state/action tables, do the following:

1. Define a set of state/action tables under the STATE/ACTION TABLES policy object for IMS (ISA entry type).
2. Link the set to the subsystem under the STATE ACTION TABLE policy item of the APPLICATION object.

Step 8 (Optional): Preparing IMS Automation to Manage an IMS XRF System

Perform the following step only if you are running an IMS subsystem that is XRF and using shared DASD within a sysplex. If your IMS configuration is XRF and the ACTIVE and ALTERNATE subsystems execute on separate CPCs then you must perform the following steps.

1. Define the RSE Name and the partners in the XRF via the "IMS XRF Resources" Policy as defined in *IBM Tivoli System Automation for z/OS Defining Automation Policy*. The IMS XRF Resources policy must be linked to the two systems in the sysplex that are to contain the XRF partner control regions.
2. The AVM address space must be defined to SA z/OS.

   This address space should be put in an Application Group that will ensure that it is started before any IMS XRF region on a system.

Step 9 (Optional): Defining NetView PPI Receiver Task

A PPI receiver may be used to communicate with IMS subsystems from NetView. This facility is only required for customers who use the EVISNCCI REXX command. Support for the EVISNCCI REXX command is being withdrawn and is only provided for compatibility with previous releases of SA z/OS.

For sample definitions and classes used to define theNetView PPI receiver task refer to the *IMS sample add-on policy.

Step 10 (Optional): Defining IMS PPI Receiver Task

A PPI receiver may be used to communicate with IMS subsystems from NetView. This facility is only required for customers who use the EVISNCCI REXX command. Support for the EVISNCCI REXX command is being withdrawn and is only provided for compatibility with previous releases of SA z/OS.

For sample definitions and classes used to define the IMS BMP region refer to the *IMS sample add-on policy.

Installing the IMS Message Exits

IBM Tivoli System Automation for z/OS Planning and Installation details the basic installation steps to install the exits into IMS. This section details the various parameters and commands that can be used to control the exits.

z/OS Exit Router Information

The out-of-the-box configuration of the exit uses the z/OS exit router to enable the user to specify exit modules at three exit points. The exit program is EVIPVEX0 and has a pre-built alias of DFSAOE00. The exit points defined are:

1. **DFSAOE00.CMD**

   This is invoked whenever DFSAOE00 is called with AOE0FUNC = 1 to initialize the routines and also when AOE0FUNC = 2 is called with AOE0FLG2 = X'80' (command entered at a terminal), X'20' (ICMD command) or X'10' (internal command).

2. **DFSAOE00.MSG**

   This is invoked whenever DFSAOE00 is called with AOE0FUNC = 1 to initialize the routines and also when AOE0FUNC = 2 is called with AOE0FLG2 = X'08' (message segment).

3. **DFSAOE00.CMDRESP**

   This is invoked whenever DFSAOE00 is called with AOE0FUNC = 1 to initialize the routines and also when AOE0FUNC = 2 is called with AOE0FLG2 = X'40' (command response segment).

Specification of routines to run at each exit point is done via PROGxx members of SYS1.PARMLIB or via the SETPROG EXIT command.

You may enable or disable exits dynamically at any time.

A required definition of EVIPVEX1 is needed to process the exit information for SA z/OS. However, any number of exit routines may be added at any of the points. The z/OS exit router will execute them one after the other. If exit routines are not specified for an exit point, no action will be taken.

The definitions of the required exit points are:

```
EXIT ADD EXITNAME(DFSAOE00.MSG) MODNAME(EVIPVEX1) DSNAME(ING.SINGMOD1) STATE(ACTIVE)
EXIT ADD EXITNAME(DFSAOE00.CMD) MODNAME(EVIPVEX1) DSNAME(ING.SINGMOD1) STATE(ACTIVE)
```

See *z/OS MVS Initialization and Tuning Reference* for additional parameters that can
be supplied to the EXIT statement.

The SA z/OS exit routines EVIPVEX0 and EVIPVEX1 use the last three words of
the storage pointed to by SXPLAWRK. If these values are changed, then
unpredictable results may occur.

The SA z/OS exit router will set AOE0RPLY to 1 if there are no exit routines
enabled for an exit and a DFSAOUE0 module is present in the IMS system. This
rule applies to each exit point independently. This means that the user can disable
an exit point and still have their DFSAOUE0 module invoked. In addition if the
exit point invoked is EVIPVEX1 as specified, see "Using the SA z/OS Exit without
the z/OS Exit Router" for details on invoking DFSAOUE0. Note that it is possible
using the z/OS exit router to invoke DFSAOUE0 for all three exit points. This can
be achieved by the default definition which does not define an exit point for
DFSAOE00.CMDRESP or by disabling this exit point.

Using the SA z/OS Exit without the z/OS Exit Router

As detailed in the installation manual, it is possible to use the System Automation
exit in a stand alone manner. In this mode, no z/OS exit router is enabled and
dynamic management of the exit is not possible. The procedure to enable this
function is detailed in the System Automation installation manual. It basically
re-defines the DFSAOE00 alias from the EVIPVEX0 module to the EVIPVEX1
module.

The SA z/OS exit will set AOE0RPLY to 1 if there is a DFSAOUE0 module present
in the IMS system and any of the following conditions are met:
- AOE0FUNC = 2 and AOE0FLG2 = AOE0MSGS
- AOE0FUNC = 2 and AOE0FLG2 = AOE0TCMD or AOE0ICMD or AOE0INTC

In effect this means that every system Message or Command will also invoke
DFSAOUE0 if it is present. Command Responses will not invoke DFSAOUE0. It is
not possible to invoke DFSAOUE0 for command responses in this mode of exit
operation. See "z/OS Exit Router Information" on page 13 or "Calling the
SA z/OS Exit from Your DFSAOE00 Module" for alternatives.

Due to an IMS restriction, when DFSAOUE0 is present in the environment only the
first segment of a multi-segment message will be presented to DFSAOE00.
Therefore, tokens that are defined in the policy database must be present in the
first segment to be matched. However, all segments will be passed to DFSAOUE0.

> **Note:**
> Make sure that the ING.SINGMOD1 library is not concatenated before of the
> library that you have redefined the alias in. If it is, then the z/OS exit router
> module will be enabled at the DFSAOE00 exit point.

Calling the SA z/OS Exit from Your DFSAOE00 Module

If neither of the above methods suits your installation, it is possible to directly call
the EVIPVEX1 module from your DFSAOE00 exit routine.

Input parameters are:

1. Register 1 points to the SXPL (standard Exit Parameter List) as supplied by IMS to the DFSAOE00 exit.

Used storage: The exit uses the last three words of the storage pointed to by SXPLAWRK. They are used by the exit to hold pointers to work area and policy information. If the values are changed, then unpredictable results may occur.

You are responsible for the correct setting of the AOE0RPLY field. Note that after calling EVIPVEX1, the AOE0RPLY field will be set as specified in "Using the SA z/OS Exit without the z/OS Exit Router" on page 14.

A sample call is as follows:

```
LA R1,SXPL   ; Load address of SXPL
L R15,=V(EVIPVEX1)  ; get address of routine
BALR R14,R15   ; invoke the exit
```

Using the IMS Automation Message Policy

To enable the IMS message exit to process messages, the messages must be defined in the policy database. The Messages/User Data policy item is used to define the messages. If there are no messages defined to use the exits, the SA z/OS exit will not process any messages.

Each subsystem has its own policy and does not share policy information, except for CLASS information, with other subsystems. This means that you can update the policy information for a subsystem or set of subsystems and will not affect other subsystems.

Defining IMS Messages

There are several special keywords that, when added to the message via the USER policy, will cause the message information to be loaded into the appropriate exit for processing. The keywords and their descriptions are:

Table 7. Keywords in IMS Message Definitions

Keyword	Description
OFFSET	This keyword is required to load the message into the exit. It specifies the position in the message that represents the message id. Its format is a single integer number. For instance, an OFFSET of 3 means: the third word in the message.
TOKEN	This keyword specifies the matching token values for user messages. It is optional, but if present only messages that match the values specified will be WTO'd. Its format is ►►──(──┬─(*number*,*value*)─┬──)─────────────────────►◄ where *number* is the position to be checked and *value* is the text to be checked. Positions are specified by counting words from the beginning of the message starting from 1. A word is considered to be a contiguous set of alpha-numeric characters. All non-alpha-numeric characters are treated as delimiters. The value specification is checked for the length specified. This allows for trailing data to be ignored. The format of the number is a single integer. The format for the value is a single alpha-numeric word, no blanks or special characters are allowed. The CASE of the value is ignored.

To define a message to be WTO'd , do the following:

1. Specify the message id in the MESSAGES/USER DATA policy item.
2. Specify the OFFSET keyword in the USER part of the policy with the data being the number of the word position that the message id occurs at in the message.
3. Optionally specify the TOKEN keyword in the USER part of the policy with the data being the words and their values to be matched.

Refreshing policy data

To load the information into IMS address spaces issue the INGAMS REFRESH command. As a part of the ACF load, each IMS that had changes to MESSAGES/USER DATA policy will be reloaded with any changes.

If you want to disable the exits, either delete the messages out of the policy or change the OFFSET keyword on every message to some other name, for example, UFFSET, and rebuild and reload the ACF.

Chapter 3. How to Set Up the Special Functions of IMS Automation

This chapter explains how to set up the special functions of IMS Automation for your specific needs. For the setup of base functions, like starting and stopping subsystems, see the SA z/OS documentation.

Special Start and Stop Dependencies

This section discusses general restrictions for the definition of dependency relationships between IMS regions and how an XRF, CQS, and FDR complex must be defined in the SA z/OS policy database.

General Restrictions

IMS Automation supports dependency relationships as provided with the SA z/OS product with the following restrictions:

- An IMS control region in a DB/DC environment must be a child, grandchild or greatgrandchild of VTAM® by the *HasParent* relationship. This does not hold for DB control regions, since these do not use VTAM.
- Certain IMS dependent regions (DBRC and DLISAS) must be direct children of the control region by the *HasParent* relationship and must have their *External Startup* and *External Shutdown* fields set to ALWAYS in their AUTOMATION INFO policy item.
- Any region, for which the *External Startup* or the *External Shutdown* field is set to ALWAYS in its AUTOMATION INFO policy item, must be a direct child of the control region by the *HasParent/StartsMeAndStopsMe* relationship and must not have multiple parents defined.
- When a dependent region is defined as a child of more than one subsystem, then the owning control region must be specified as the lowest numbered *HasParent* relationship to enable IMS Automation to determine which control region owns the dependent region. Note that you *must* number the *HasParent* relationship to the IMS control region.
- IMS Automation does not support one-shot, transient subsystems as dependent regions. Any dependent region with a status of ENDED will be reset to a status of DOWN when the control region starts.
- CQS and FDR regions cannot be defined as dependent regions.
- If the IMS control region ends abnormally and one or more of the dependent IMS regions are still UP then the dependent IMS regions have to be canceled with operator commands.

  If there is a *FORCEDOWN/WhenobservedDown* relationship between the dependent IMS regions and the IMS control region the cancelation is done via SA z/OS.

Defining an FDR Environment

Figure 3 on page 18 illustrates the relationships that need to be set up to handle IMS FDR regions. These relationships prevent the FDR from being put into STOPPED state (outside of automation) when the FDR terminates.

Figure 3. Relationships for IMS FDR

> **Note:**
> The IMS_FDR application should be defined with "External Shutdown" set to "FINAL" and "Restart Option" set to "ALWAYS" in the Automation Policy data base.

In order to simplify the start/stop of IMS and its associated FDR you can proceed as follows:

1. Create an application group (with **Application Group Type**=SYSTEM, **Nature**=BASIC) with the control region and its dependent regions as member resources.
2. Create another application group (with **Application Group Type**=SYSPLEX, **Nature**=BASIC) which contains the group defined in step 1 and the FDR region as its member resources.

Then, start and stop the application group created in step 2.

How to Automate Startup and Shutdown of IMS Regions

This section describes how to code startup and shutdown procedures for the different types of IMS regions.

Startup

For *control* regions, the start commands must be defined in the STARTUP item of the APPLICATION policy object. A possible format for these commands would be

```
MVS S job_name,PARM1='AUTO={Y|N}'
```

You must code a start command for every valid startup type (that is, for AUTO, BUILDQ, COLD, NORM, WARMSDBL, or *user*). However, for DBCTL regions, commands defined for start type AUTO are ignored and, for start type NORM, commands are optional. If you wish to reply to the DFS810A message then you should enter a start command specifying `AUTO=N`. The External Startup field of the APPLICATION INFO policy item must be set to NEVER for control regions.

For *any other* region type, you must specify start commands in the STARTUP policy item when the External Startup field of the AUTOMATION INFO policy item is set or defaulted to INITIAL or NEVER. If it is set to ALWAYS such dependent regions are expected to be started by the associated control region.

You can pass user-defined parameters to the startup command by incorporating the &APPLPARMS variable into the command. You can specify a string in the Appl Parms field of the INGREQ input panel (for the INGREQ command see Chapter 7, "Starting and Stopping Resources," on page 107). The string is stored in the &APPLPARMS variable before this variable is replaced by its value in the start command. For compatibility reasons variable &EHKVAR1 can be used as well instead of variable &APPLPARMS.

Shutdown

Here a distinction must be made between control regions and other region types.

Control Regions

For control regions, you must specify the shutdown commands in the SHUTDOWN item of the APPLICATION policy object. The commands must have the following format:

```
EVIET001 subsystem_name,{NORM|IMMED|FORCE},{DUMPQ|BACKUP|FREEZE|PURGE|DUMP|NODUMP}
```

The second parameter is called the shutdown *type*, the third is called the shutdown *option*.

A brief definition of the three shutdown types follows:

NORM   causes a checkpoint to be issued and an attempt to shut down IMS in an orderly, structured manner; cancellation of message regions and the control region occurs after a predetermined time delay.

IMMED   causes a checkpoint to be issued and immediate cancellation of message regions; cancellation of the control region occurs after a predetermined time delay.

FORCE   causes immediate flushing of the entire IMS complex, including message and control regions.

Generally, the NORM parameter is specified with the NORM phase of the SHUTDOWN policy item and the IMMED parameter is specified with the IMMED phase. It is possible, but not recommended, to intermix the NORM or IMMED parameters with either the NORM or IMMED phases (operator selection of the NORM or IMMED shutdown type in the INGREQ input panel relates to the NORM and IMMED phases respectively; however, the actual shutdown type is then dictated by either the NORM or IMMED parameter as specified in the command). The FORCE parameter *must* be specified with the FORCE phase.

The shutdown options (BACKUP, DUMPQ, FREEZE, PURGE, DUMP, NODUMP) serve to call additional commands during the shutdown process. Every shutdown option must be associated with a command through the reserved SHUTTYPES message ID (see "SHUTTYPES—Issue Commands at Operator Shutdown" on page 72), which has to be defined in the MESSAGES/USER DATA policy item of the application.

When you do a NORM or IMMED shutdown, the only options allowed are:
- For a DBCTL region: PURGE, FREEZE
- For a CTL region: PURGE, FREEZE or DUMPQ

When you do a FORCE the only options allowed are DUMP or NODUMP.

The option specified for the respective phase is the default; you can override it when you put a shutdown request to SA z/OS with the INGREQ command.

When a shutdown request contains no option override, EVIET001 issues the command that is associated with its shutoption parameter in the SHUTTYPES entry; otherwise it issues the command that is associated with the override option.

The following example illustrates the mechanism. Suppose that the shutdown command for the NORM phase is coded for the IMS control region IMSIMSZ as displayed in the following panel:

```
   COMMANDS   HELP
 ------------------------------------------------------------------------------
 AOFPISHC                    Shutdown Command Processing          Row 1 of 20
 Command ===> _____       SCROLL===> PAGE

 Entry Type : Application          PolicyDB Name   : USER_PDB
 Entry Name : IMSIMSZ              Enterprise Name : USER_ENTERPRISE

 Subsystem    : IMSIMSZ
 Shutdown Phase: SHUTNORM          External Shutdown:

 Enter commands to be executed when the selected shutdown phase is invoked
 for this subsystem.

 Pass        Automated Function/'*'
 Command Text
 1_          _____
 EVIET001 IMSIMSZ,NORM,DUMPQ_____
 _____


 __          _____
 _____
```

Figure 4. Shutdown Command for IMS Control Region

Note that only one pass is coded. The logic in EVIET001 will handle all subsequent shutdown activities.

Suppose furthermore that the SHUTTYPES entry for IMSIMSZ looks as follows:

```
   COMMANDS   HELP
 ------------------------------------------------------------------------------
 AOFGMSGR                       Reply Processing                 Row 1 of 20
 Command ===> _____       SCROLL===> PAGE

 Entry Name : IMSIMSZ              Message ID : SHUTTYPES

 Enter the replies to be issued when this resource issues the selected message
 or define this message as status message.

 Status . . . _____       ('?' for selection list)

 Pass/       Retry Reply Text
 Selection   Count
 DUMPQ_____   5_   /CHE DUMPQ_____
 FREEZE____   5_   /CHE FREEZE_____
 PURGE_____   5_   /CHE PURGE_____
 _____    __    _____
 _____    __    _____
 _____    __    _____
```

Figure 5. SHUTTYPES Entries

Now, if you require that IMSIMSZ be shut down with the INGREQ command, and specify NORM as the shutdown type, then the command specified for the NORM phase, namely EVIET001 IMSIMSZ,NORM,DUMPQ is issued (see Figure 4). This entails that the corresponding command of the SHUTTYPES entry, namely /CHE DUMPQ, is invoked (see Figure 5), unless you specify another shutdown option in the **Appl**

Parms field of the INGREQ input panel. If you do this and enter, for example, `OPTION=FREEZE` in this field, then `/CHE FREEZE` will be issued instead of `/CHE DUMPQ`. See also "Shutdown" on page 108.

Other Region Types

For any other region type, two cases must be distinguished. If the **External Shutdown** field of the AUTOMATION INFO policy item is set to ALWAYS, no specifications are needed. Otherwise, proceed as follows.

A HASPARENT relationship must exist between the dependent region and the owning IMS control region. This relationship is defined in the APPLICATION policy item for the dependent region using the RELATIONSHIPS entry. The HASPARENT definition, pointing to the control region, must have a sequence number of 1.

Defining this HASPARENT relationship also removes the requirement to specify the control region name on the 'Control Region Name' field of the IMS ENVIRON entry in the dependent region's APPLICATION policy item even if multiple parents are defined.

Specify shutdown commands in the SHUTDOWN item of the APPLICATION policy object. The commands must have the following format:

`EVIET00J &SUBSAPPL,{NORM|IMMED|FORCE}`

The EVIET00J command can set two &EHKVAR variables:

EHKVAR1
> This is the dependent region id that can be used in a `/STOP REGION id` command.

EHKVAR2
> This can be set to the transaction name of the transaction running on a region. It is set for TPs and BMPs and only if the region does not have a status of WAITING, WAIT-SWITCHOVER or WAIT-MESSAGE.
>
> For BMPs this variable is conditional on the contents of the commands to be executed. There must be a `/PSTOP TRANSACTION &EHKVAR2` command in the list of commands to execute.

The actual shutdown command is then determined by the shutdown type specified for EVIET00J and by the region type. The BMP, FP, and dependent message region types are each associated with a special reserved message ID which you must define in the MESSAGES/USER DATA policy item of the associated *control* region. These entries will specify for every shutdown type the command that is issued for the region type in question. The following table specifies the message IDs for the different types:

Region Type	Associated Message ID
BMP regions	STOPBMPREGION, see "STOPBMPREGION—Stop Batch Message Regions" on page 75.
FP regions	STOPFPREGION, see "STOPFPREGION—Stop Fast Path Regions" on page 77.
Dependent message regions	STOPREGION, see "STOPREGION—Stop IMS Dependent Message Region" on page 78.

The following example illustrates the mechanism. Suppose that BMPIMSA is a BMP region, that the **External Shutdown** field of its AUTOMATION INFO policy item is not set to ALWAYS, and that the shutdown command for the NORM phase in its SHUTDOWN policy item is coded as follows:

```
  COMMANDS  HELP
-------------------------------------------------------------------------------
AOFPISHC                    Shutdown Command Processing            Row 1 of 20
Command ===> _____        SCROLL===> PAGE

Entry Type : Application            PolicyDB Name   : USER_PDB
Entry Name : BMPIMSA                Enterprise Name : USER_ENTERPRISE

Subsystem    : BMPIMSA
Shutdown Phase: SHUTNORM            External Shutdown:

Enter commands to be executed when the selected shutdown phase is invoked
for this subsystem.

Pass          Automated Function/'*'
Command Text
1_              _____
EVIET00J &SUBSAPPL,NORM_____
_____


__              _____
_____
```

Figure 6. Shutdown Command for a Dependent Region

Furthermore, suppose that BMPIMSA is associated with the control region IMSIMSZA. The message ID that determines the shutdown command for BMP regions is STOPBMPREGION. Thus, there must be an entry for this message ID in the MESSAGES/USER DATA item of IMSIMSZA, which could look as follows:

```
  COMMANDS  HELP
-------------------------------------------------------------------------------
AOFGMSGR                        Reply Processing                   Row 1 of 20
Command ===> _____        SCROLL===> PAGE

Entry Name : IMSIMSZ             Message ID : SHUTTYPES

Enter the replies to be issued when this resource issues the selected message
or define this message as status message.

Status . . . _____    ('?' for selection list)

Pass/       Retry Reply Text
Selection   Count
NORMAL____   5_   /STOP REGION &EHKVAR1_____
ABEND_____   5_   /STOP REGION &EHKVAR1 ABDUMP_____
CANCEL____   5_   /STOP REGION &EHKVAR1 CANCEL_____
CANCEL____   5_   /STOP REGION &EHKVAR1 CANCEL ABDUMP_____
_____  __   _____
_____  __   _____
_____  __   _____
```

Figure 7. STOPBMPREGION entry for Associated Control Region

The three **Pass/Selection** values correspond to the three shutdown types according to the following table:

Shutdown type	Corresponding value
NORM	NORMAL
IMMED	ABEND

Shutdown type	Corresponding value
FORCE	CANCEL

Now, when a request to shut down BMPIMSA with shutdown type NORM is put to SA z/OS, then EVIET00J is called as specified for the NORM phase of the SHUTDOWN policy item (see Figure 6 on page 22). EVIET00J determines that BMPIMS is a BMP region, consults the STOPBMPREGION entry of the associated IMS control region IMSIMSZA (see Figure 7 on page 22), and issues the command of that entry whose first value corresponds to the second parameter of the call. In the example, this is the command /STOP REGION &EHKVAR1.

IMSPlex Support Subsystems

IMSPlex support that can be automated is the SCI, OM and RM.

Sample definitions are in the *IMS add-on sample.

All subsystems are defined as MVS™ subsystems.

The following sample subsystem definitions can be used as a template for basic automation functions:
- For the SCI: IMSSCI
- For the OM: IMSOM
- For the RM: IMSRM

Automating Recovery for Application Components

IMS Automation provides automated recovery for the following application components:
- MSC links
- OLDS
- Transactions
- Programs.

You can control the automated recovery for these components through the following three policy items of the APPLICATION object:

MINOR RESOURCE FLAGS
>With these flags, you can switch automated recovery on and off for application components. To do this, you must define a minor resource and set its **Recovery** flag as required; for the definition of minor resources, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*. The names of these minor resources must be as follows:

Table 8. Minor Resource Names for Application Components

Component	Minor resource name
MSC links	MSC[.*link_id*]
OLDSs	OLDS
Transactions	TRAN[.*trans_id*]TRXABEND
Programs	PROG[.*prog_id*]

>For transactions, you can also define second-level minor resources by suffixing TRAN with the transaction name. The recovery flag of the TRAN

minor resource applies to all transactions of the respective application, TRAN.*trans_id* only applies to the *trans_id* transaction. The transaction-specific recovery flag overrides the general TRAN flag. The same mechanism applies to the MSC and PROG minor resources.

When no minor resources are defined, IMS Automation acts according to the recovery setting of the application (AUTOMATION FLAGS policy item). When no second-level minor resource is defined for a transaction, the TRAN minor resource is applied. If that does not exist either, the application setting is applied. This also applies to the PROG and MSC resources. Thus, you only need to define minor resources when the recovery setting for a lower level is to be different from the next higher level.

RESOURCE THRESHOLDS

With this IMS-specific policy item (see *IBM Tivoli System Automation for z/OS Defining Automation Policy*), you determine the threshold at which recovery should stop. This threshold is defined by the number of errors within a certain time interval. As with the recovery flags, you must associate the threshold definition with the transaction/problem area by giving it one of the names listed in Table 8 on page 23; you can also specify thresholds for a single transaction, program, or MSC link.

MESSAGES/USER DATA

For every recovery type, there are one or more keywords that are used to specify how recovery is to proceed. These keywords are:

Table 9. MESSAGES/USER DATA Keywords for Component Recovery

Application components	Keywords
MSC links	DFS2142 (see page 46), DFS2161I (see page 47), DFS2169I (see page 48)
OLDSs	OLDS (see page 60), DFS3258A (see page 49)
Transactions	ABCODETRAN (see page 37), DFS554A (see page 50)
Programs	ABCODEPROG (see page 34), DFS554A (see page 50)

In the following sections, recovery configuration is described in more detail for transactions.

How to Define Transaction Recovery

Customization of transaction recovery consists of:
- Determining which application program (TP) transactions will have recovery automation
- Identifying the batch message region (BMP) transactions that will have recovery automation
- Specifying the error threshold level at which a recovery should stop
- Identifying specific abend codes for which you want recovery procedures to occur
- Specifying the recovery procedure, which usually consists of invoking a command, a routine, and/or sending notifications to an operator

The recovery itself is typically triggered from the AT by calling the EVIEY00S routine when certain messages arrive at NetView. EVIEY00S then consults the

TRAN state/action table in order to learn whether recovery is to be attempted. If so, the ACF is consulted in order to determine what has to be done.

The following sections illustrate the configuration process by an example.

Specifying the Transactions or Programs to be Recovered

Suppose that recovery is enabled for the IMS10AA application on the application level, and that you want it also enabled for transactions PAYR, DBTS, and BLNG, but not for any other transaction. Then you must define four minor resources for IMS10AA in the customization dialog as follows:

```
   COMMANDS  HELP
  -------------------------------------------------------------------------------
  AOFPIMR3                        Minor Resource Flags                Row 1 of 21
  Command ===> _____      SCROLL===> PAGE

  Entry Type : Application            PolicyDB Name   : TEST
  Entry Name : IMS10AA                Enterprise Name : USER_ENTERPRISE

  Major Resource: IMS10AA

  Action  Minor Resource
  s       TRAN
  _____  TRAN.BLNG
  _____  TRAN.DBTS
  _____  TRAN.PAYR
  _____  _____
```

Figure 8. Defining Minor Resources for Transactions

Set the recovery automation flag to NO for TRAN and to YES for the three second-level minor resources. For example, to do this for TRAN, enter s in the **Action** column and press ENTER. The following panel is displayed:

```
   COMMANDS  ACTIONS  HELP
  -------------------------------------------------------------------------------
  AOFGFAS1                     Flag Automation Specification
  Command ===> _____

  Entry Type : Application            PolicyDB Name   : USER_PDB
  Entry Name : IMS10AA                Enterprise Name : USER_ENTERPRISE

  Resource:  IMS10AA.TRAN
  Enter level of automation desired.

  Automation Flags:  Y = Yes     N = No   E = Exits
  Assist Flags:      D = Display  L = Log  N = None

  Actions    Flag          Auto      Assist    Exits
  _____   Automation .  _____    _____    0
  _____   Recovery . .  NO        _____    0
  _____   Start. . . .  _____    _____    0
  _____   ShutDown . .  _____    _____    0
  _____   Initstart. .  _____    _____    0
  _____   Restart. . .  _____    _____    0

  Enter or Display times to disable automation . . NO_____    Yes   No
```

Figure 9. Automation Flag Panel

Here you specify which flags are set and which are not. For more information, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

In the same way you can fine-tune recovery automation for programs. Just replace the `TRAN` keyword with `PROG`.

Defining Recovery Thresholds

You can specify that recovery is to be stopped when the number of abends within a certain time interval reaches a certain threshold. To do that, define thresholds under the IMS-specific RESOURCE THRESHOLDS item of the APPLICATION policy object. The thresholds must have the name TRAN or TRAN.*tranid*, where the values of the TRAN thresholds will be used for all transactions *tranid* for which no TRAN.*tranid* thresholds exist. The **Critical** value of the thresholds will be used.

If you want to stop recovery specifically for PAYR if two or more abends occur within one hour, you must enter the values on the **Thresholds Definitions** panel as follows:

```
  COMMANDS  HELP
  --------------------------------------------------------------------------
 AOFPIZTH                        Thresholds Definition
 Command ===> _____

 Entry Type : Application          PolicyDB Name   : USER_PDB
 Entry Name : IMS10AA              Enterprise Name : USER_ENTERPRISE

 Resource:     IMS10AA.TRAN.PAYR

 Specify the number of times an event must occur to define a particular level.

 ------------------------ Threshold Levels ------------------------
     Critical                 Frequent                 Infrequent
  Number  Interval         Number  Interval         Number  Interval
          (hh:mm)                  (hh:mm)                   (hh:mm)

   2     01:00              2     05:00              2     24:00
```

Figure 10. Thresholds Definitions Panel

For more details, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

For recovery thresholds of programs, you must use `PROG` instead of `TRAN` as the first part of the thresholds' name.

Selecting the Abend Codes

The abend codes for which recovery is to take place are specified in the MESSAGES/USER DATA policy item for IMS10AA through

- the ABCODETRAN keyword for transactions, and
- the ABCCODEPROG keyword for programs.

If you want to initiate recovery for transaction PAYR only when the abend code is U3033 or U907, you need to create an ABCODETRAN.PAYR entry in the MESSAGES/USER DATA policy item and use action "code" on it. This will take you to the Code Processing panel shown in Figure 11 on page 27.

```
   COMMANDS  HELP
 ------------------------------------------------------------------------------
 AOFGMSGK                           Code Processing                 Row 1 of 20
 Command ===> _____        SCROLL===> PAGE

  Entry Name : IMS10AA          Message ID : ABCODETRAN.PAYR

 Enter the value to be passed to the calling CLIST when this resource
 issues the selected message and the following codes are contained in
 the message.

     Code 1          Code 2          Code 3           Value Returned
 _____  U3033_____  _____   INCLUDE_____
 _____  U907_____  _____   INCLUDE_____
 _____  *_____  _____   EXCLUDE_____
 _____  _____   _____   _____
 _____  _____   _____   _____
 _____  _____   _____   _____
 _____  _____   _____   _____
```

Figure 11. Code Processing Panel

For more details, see "ABCODETRAN—Transaction Abend Recovery" on page 37.

In a similar way, you can use the ABCODEPROG keyword to include certain abend codes for certain programs in recovery automation.

Specifying Recovery Actions

You specify the commands to be issued for recovery in the **CMD Processing** panel for the DFS554A message ID of IMS10AA. For example:

```
   COMMANDS  HELP
 ------------------------------------------------------------------------------
                                   CMD Processing             Row 1 to 2 of 20
 Command ===>                                                 SCROLL===> PAGE

 Entry Type : Application          PolicyDB Name   : USER_PDB
 Entry Name : IMS10AA              Enterprise Name : USER_ENTERPRISE

 Subsystem  : IMS10AA
 Message ID : DFS554A

 Enter commands to be executed when resource issues the selected message.

 Pass/Selection Automated Function/'*'
 Command Text
 TRAN_____   _____
 IMSCMD &SUBSAPPL  /STA TRAN &EHKVAR1_____

 _____

 PROG_____   _____
 IMSCMD &SUBSAPPL  /STA PGM &EHKVAR2_____

 _____
```

Figure 12. Command Processing Panel

For more details, see "DFS554A—Respond to Program Abend" on page 50.

How to Set Up the State/Action Tables

A major portion of automation involves driving actions based on *events* like error messages or operator actions. One way IMS Automation does event-driven automation is by associating a single message (an event) with a single automated response such as issuing a command, writing a message, or issuing an alert (the action). This is done in the AT.

However, you may want different automated actions to occur in reaction to the same event under different conditions. For example, you may want different actions to be taken depending on whether the application is active or inactive when the event occurs. IMS Automation provides *state/action tables* for this type of automation. The state/action tables associate the event with the application's *state*, (active, stopping, down, and so on).

In IMS Automation, state/action tables are used for recovery of the following application components:
- MSC links
- OLDs
- Transactions
- Programs

State/action tables work independently of service periods and external triggers and are referenced when messages occur that are relevant to these entities.

If you want to enable automated recovery for the application components listed above, proceed as follows:
- If the recovery flag of the application (AUTOMATION FLAGS policy item) is set to NO, define a minor resource for the respective component in the customization dialogs under the MINOR RESOURCE FLAGS policy item of the IMS application and set its recovery flag to YES. For details, see "Automating Recovery for Application Components" on page 23.
- Associate the respective IMS subsystem with a set of state/action tables. To do this, you must perform two steps in the customization dialogs:
  1. Define a set of state/action tables as an IMS STATE/ACTION policy object for IMS (ISA entry type, to be found in the PRD entry type).
  2. Link the set to the subsystem under the STATE ACTION TABLE policy item of the APPLICATION object.

The state/action tables are read and the actions or state changes are performed by the common state handler routine. This routine is typically invoked from the AT. It determines which set of state/action tables is associated with the subsystem that issued the message, and then consults the appropriate table. If the table cell determined by the state and the message ID contains a call of the recovery program , recovery is initiated. In the case of a transaction recovery, the recovery program makes use of the items described in "How to Define Transaction Recovery" on page 24.

In addition to the state handler, the following components for support of state/action processing are shipped with IMS Automation:
- Default state/action tables for the different components. These are:

Component	Name of state/action table
MSC links	EVISS002
OLDS	EVISS003
Transactions/programs	EVISS005

- Common routines to be used by the action routines.
- Action routines for the different components.

Every state/action table is associated with an *area* and a *product*. The area tag specifies for which of the three problem areas the table is intended, the product tag says whether the table is to be used by IMS Automation or by CICS® Automation. These tags must be specified in the first two rows of the table. The format for IMS Automation is:

```
PRODUCT=IMS
AREA={MSC|OLDS|TRAN}
```

In the third row of the table, you must specify the initial state of the table, that is, the state that is assumed when the table is consulted for the first time.

The state/action table works like this:

1 **Event**

When an event occurs, IMS Automation finds the event in the state/action table. For example, when message DFS2161I is received, IMS Automation finds `EVENT=DFS2161I` in the state/action table.

2 **State**

IMS Automation checks the state of the application. For this example, the application is assumed to be in its initial state; the state value for the initial state is 0.

Notice that the other valid states in this sample table are down (state value 1), up (state value 2), stopping (state value 3), and disconnected (state value 4).

3 **Entry (action/new state)**

IMS Automation finds the associated entry. For this example, the entry is located in the same row as `EVENT=DFS216I` and the same column as the initial state (`INIT`). The entry IMS Automation finds is `EVIECM01/3`, which gives IMS Automation two pieces of information: the action to take (EVIECM01) and the new state value (3). Thus, IMS Automation calls the routine EVIECM01 and sets the state value for the application to 3, which is "stopping" in this example.

Note: `NA` signifies that this event/state combination cannot occur.

By changing the state of the application, IMS Automation records which events have occurred. By specifying an action to be performed along with the new state, IMS Automation compiles a complete package which:

- Maintains a history of events
- Identifies when to execute an action
- Identifies what action to execute.

Adding Local Applications to the IMS Automation Operator Interface

Option 99, Local Applications, from the IMS Automation main menu, enables you to add your local applications to the IMS Automation interface.

To do this, write a module named EVIEU000 using the usage notes described below. We do not provide this module. However, this module is called when option 99 is selected.

These usage notes assume that you understand how to write a NetView panel handler EXEC. These notes clarify unique functions or conventions used with IMS

Automation. For your panel to be logically consistent with the IMS Automation
interface, incorporate the following usage notes.

Usage notes:

1. To exit IMS Automation (PF2) or to return to the main menu (PF4) code the
   following after displaying your panel and accepting the input:

```
WHEN VIEWAID = 'PF2' | VIEWAID = 'PF14' THEN
   DO
     EVI_PF2 = 'YES'
     'GLOBALV PUTT EVI_PF2'
     EXIT 0
   END
     and
WHEN VIEWAID = 'PF4' | VIEWAID = 'PF16' THEN
   DO
     EVI_PF4 = 'YES'
     'GLOBALV PUTT EVI_PF4'
     EXIT 0
   END
```

When you call a module and you return from that module, you should exit if
the called module displays a panel and PF2 or PF4 was pressed. To check for
this, code the following after the call.

```
'GLOBALV GETT EVI_PF2'
IF EVI_PF2 = 'YES' THEN
   DO
      EXIT 0
   END
     and
'GLOBALV GETT EVI_PF4'
IF EVI_PF4 = 'YES' THEN
   DO
      EXIT 0
   END
```

2. To handle fastpath:
   - Add the following to the beginning of the program:

     ```
     'SIGNAL ON HALT'
     ```

     Add the following routine:

     ```
     HALT:
         EVI_PF2 = 'YES'
         'GLOBALV PUTT EVI_PF2'
         EXIT 0
     ```

   - Add the following code to support fastpath entered on your panel by the
     operator:

     ```
     WHEN VIEWAID = 'ENTER' & CMD ¬= ''THEN
        DO
          IF SUBSTR(CMD,1,1) = '=' THEN
             DO
                PARSE VAR CMD '=' REST
                CMD = 'EVIE0000 ' || REST
             END
          'CMD HIGH 'CMD
        END
     ```

     Note: In this code, CMD is the command line on the NetView panel.

   - If you code a menu panel, add the following code to support fastpath entry:

```
'GLOBALV GETT EVI_SELECTION'
IF EVI_SELECTION ¬= ''
   DO
     PARSE EVI_SELECTION MYSELECTION '.' EVI_SELECTION
    'GLOBALV PUTT EVI_SELECTION'
   END
```

3. Support for the name of the IMS subsystem:
   - On entry, or returning from a called routine, to get the IMS subsystem name (if the previous routine had a valid name and saved it) code the following:

     ```
     'GLOBALV GETT EVISELNM'
     MYNAME = EVISELNM
     ```

   - Validate the name using the command processor described in "IMSQRY—Name Lookup" on page 91. Following is an example of usage:

     ```
     'IMSQRY REQ=VALIDATE,TYPE=IMS,NAME='MYNAME
     IF RC ¬= 0
        DO
         write your error message
        END
     ELSE
        EVISELNM = MYNAME
        'GLOBALV PUTT EVISELNM'
     ```

Chapter 4. MESSAGES/USER DATA Entries for IMS Automation

As IMS Automation is integrated into SA z/OS, you must enter any information for IMS Automation in the policy database via the customization dialog. In most cases, the customization dialog itself restricts you to the format in which this information must be entered. There are, however, a number of IMS-specific automation parameters that must or can only be specified as entries in the MESSAGES/USER DATA policy item of the application policy object in point; for the MESSAGES/USER DATA policy item, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*. In these cases, the customization panels provide no information about the keywords and the format of their parameters.

The following chapter contains detailed descriptions of these automation entries. However, a general understanding of the MESSAGES/USER DATA policy item is assumed.

IMS-Specific MESSAGES/USER DATA Keywords

Most of the following keywords must be specified in the MESSAGES/USER DATA item of the respective *control* region and apply to DB control regions as well as to IMS control regions. They need to be entered in the MESSAGE ID field on the Message Processing panel.

ABCODEPROG—Respond to BMP Region Abends

Use this keyword to define actions to be taken for program abends of program-driven batch message processing (BMP) regions. Only abends for program-driven BMPs use this keyword. Transaction driven BMPs use the ABCODETRAN keyword to determine recovery actions.

Use code processing on the Message Processing panel.

Code 1	Code 2	Code 3	Value Returned
*	*acode*	*progid*	INCLUDE or EXCLUDE

Note: The ABCODEPROG keyword may be followed with a dot and a program ID *progid*.

Keyword and Parameter Definitions

ABCODEPROG[._progid_**]**
You can add the name of a program as a suffix to the keyword. In this case the specifications of the CODE attribute(s) will only apply to this program.

CODE=
Use this keyword to define which abends should be included or excluded from recovery.

* An asterisk as the first positional parameter is required for compatibility with the ABCODETRAN entry. Code an asterisk as shown.

acode
The abend code. An asterisk (*) can be used for generic specifications. System abend codes should be prefixed with an S, such as S0C1.

progid
The program name.

INCLUDE|EXCLUDE
Indicates whether or not to initiate a recovery sequence for this program and abend code combination. Use INCLUDE to initiate a recovery and EXCLUDE if you do not want a recovery initiated. INCLUDE is the default.

Comments and Usage Notes

If the ABCODEPROG entry is omitted, no recovery takes place and a warning message is issued.

The program name can either be specified as **ABCODEPROG.**_progid_ or as the first value of the CODE attribute. Use **ABCODEPROG.**_progid_ when you want all of the specifications to apply to one specific program. Use the CODE attribute when you want to code several transactions.

Examples of Usage

```
Subsystem  : IMS10AA
Message ID : ABCODEPROG

Enter the value to be passed to the calling CLIST when this resource
issues the selected message and the following codes are contained in
the message.

    Code 1          Code 2          Code 3          Value Returned
*_____  U0778_____  SAMPLE4_____  EXCLUDE_____
*_____  *_____  *_____  INCLUDE_____
_____  _____  _____  _____
_____  _____  _____  _____
_____  _____  _____  _____
_____  _____  _____  _____
```

In this example, recovery will not be attempted for program SAMPL4 when the abend code is U0778. In all other cases, recovery will take place.

ABCODES—Restart control region after abend

IMS Automation processing utilizes the SA z/OS CODE specification for automated error code matching, to specify the abend codes for which SA z/OS will automatically restart an IMS control region after the abend process is complete.

```
Format
ABCODES CODE=({SYScode|IMScode},,,ABENDING|STOPPING)
        .
        .
        .
        CODE=({SYScode|IMScode},,,ABENDING|STOPPING)
```

Keyword and Parameter Definitions

ABCODES

An ABCODES entry lists codes for a non-XRF IMS control region.

CODE=

Use this keyword to define the data, as shown in the following list:

{SYScode|IMScode}

Specify the matching abend code here. All abend codes must start with either SYS for MVS system abend codes or IMS for IMS user abend codes. For system abends, *code* is a three-character alphanumeric. For IMS user abends, *code* is a four-digit number.

ABENDING|STOPPING

ABENDING defines a recoverable IMS abend. With this abend, IMS can be restarted. STOPPING defines a non-recoverable IMS abend.

Comments and Usage Notes

1. If an abend code is omitted, the abend is considered non-recoverable.
2. When an IMS control region abends with an abend code listed in the appropriate table, SA z/OS will automatically restart the IMS control region.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : ABCODES

Enter the value to be passed to the calling CLIST when this resource
issues the selected message and the following codes are contained in
the message.
   Code 1          Code 2          Code 3          Value Returned
SYS0C4_____ _____ _____ ABENDING_____
IMS0113_____ _____ _____ ABENDING_____
IMS0020_____ _____ _____ ABENDING_____
IMS0707_____ _____ _____ ABENDING_____
_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____
```

In this example, IMSIMSZ is supposed to be a non-XRF control region. It will be restarted after an abend if the abend code is one of the four listed. Any other abend will be considered irrecoverable.

ABCODETRAN—Transaction Abend Recovery

Use this keyword to include transaction abend codes in recovery or exclude them from recovery. This includes both transaction-driven message processing regions (MP) and transaction-driven batch message processing (BMP) regions.

Use code processing on the Message Processing panel.

Table 10. Data to Be Entered in the Code Processing Panel for ABCODETRAN

Code 1	Code 2	Code 3	Value Returned
tran	*abend*	*pgm*	INCLUDE or EXCLUDE
*	U3033		INCLUDE

Note: The ABCODETRAN keyword may be followed with a dot and a transaction ID *tran*.

Keyword and Parameter Definitions

ABCODETRAN[.*tran***]**
>   You can add the name of a transaction as a suffix to the keyword. In this case the specifications of the CODE attribute(s) will only apply to this transaction.

CODE
>   Defines which abends are recoverable, as shown in the following descriptions:

>   *tran*
>>   The transaction ID.

>   *abend*
>>   The abend code.

>   *pgm*
>>   The program that abended.

>   **INCLUDE|EXCLUDE**
>>   Indicates whether or not to initiate a recovery for this transaction, abend code, and program. Use INCLUDE to initiate a recovery and EXCLUDE if you do not want a recovery initiated.

Comments and Usage Notes

1. The transaction name is either specified as **ABCODETRAN.***tran* or as the first value of the CODE attribute. Use **ABCODETRAN.***tran* when you want all of the specifications to apply to one specific transaction. Use the CODE attribute when you want to code several transactions.

Examples of Usage

```
Subsystem  : IMS10AA
Message ID : ABCODETRAN.PAYR

Enter the value to be passed to the calling CLIST when this resource
issues the selected message and the following codes are contained in
the message.

    Code 1          Code 2          Code 3          Value Returned
_____  U3033_____  _____  INCLUDE_____
_____  U907_____  _____  INCLUDE_____
_____  *_____  _____  EXCLUDE_____
_____  _____  _____  _____
_____  _____  _____  _____
_____  _____  _____  _____
```

ABCODETRAN - Transaction abend recovery

In this example, recovery will take place for transaction PAYR on IMS10AA if the abend code is U903 or U3033. No recovery will take place for any other transaction or abend code.

ACORESTART—Agent Restart

This keyword is used to define the commands that may be issued when the
SA z/OS Agent is restarted and the IMS control region is already UP.

Use command processing on the Message Processing panel.

Table 11. Data to Be Entered in the CMD Processing Panel for ACORESTART

Pass/Selection	Automated Function	Command Text
—	—	EVIEE00A &SUBSAPPL

Keyword and Parameter Definitions

EVIEE00A

> This command is required to rebuild internal data from an already running
> IMS control region.
>
> The command is only required on Control Regions.

Examples of Usage

```
  COMMANDS  HELP
 ---------------------------------------------------------------------------
                              CMD Processing              Row 1 to 7 of 21
 Command ===> _____    SCROLL===> CSR

 Entry Name : IMS911_CONTROL      Message ID : ACORESTART

 Enter commands to be executed when resource issues the selected message.
 or define this message as status message.

 Status . . . _____     ('?' for selection list)

 Pass/Selection Automated Function/'*'
 Command Text
 _____
 EVIEE00A &SUBSAPPL_____
 _____

 _____   _____
 _____
 _____
```

BRO—Broadcast a Message Prior to Shutdown

This keyword is used to define the command and message text that may be issued prior to normal shutdown to indicate to active users that shutdown of the associated IMS subsystem is imminent.

Use reply processing on the Message Processing panel.

Table 12. Data to Be Entered in the Reply Processing Panel for BRO

Pass/Selection	Retry Count	Reply Text
—	*n*	/BRO ACTIVE
—	*n*	*message text*

Keyword and Parameter Definitions

/BRO ACTIVE
> This command may be issued prior to normal shutdown to indicate to active users that the IMS subsystem (*subsys*) shutdown is imminent.

message text
> The message text may be issued by the /BRO ACTIVE command as described in the parameters above. The variable &EHKVAR1 can be used in the message text; its value will be the number of minutes that IMS Automation will wait until the IMS is shut down, as specified in the **Broadcast Delay** field of the IMS ENVIRON policy item of the application.

Comments and Usage Notes

⇒ **Not required**. Not applicable for DB control regions.

You must end the *message text* input for this entry with a period.

This IMS command and associated message text can be issued just prior to the normal IMS control region shutdown process.

One variable is available for use in the BRO entry. &EHKVAR1 is the Broadcast value specified in the **Broadcast Delay** field of the IMS ENVIRON policy item.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : BRO

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
_____   5_   /BRO ACTIVE_____
_____   5_   IMS SHUTTING DOWN IN &EHKVAR1 MINUTES._____
_____   __   _____
_____   __   _____
_____   __   _____
_____   __   _____
_____   __   _____
```

CHE—Issue a Checkpoint Command

This keyword is used to specify the IMS command to be issued when a normal checkpoint is required.

- For IMS control regions, use reply processing on the Message Processing panel and fill in the data in Table 13.
- For DB control regions, use command processing on the Message Processing panel and fill in the data in Table 14.

Table 13. Data to Be Entered in the Reply Processing Panel for CHE

Pass/Selection	Retry Count	Reply Text
—	*n*	/CHE

Table 14. Data to Be Entered in the CMD Processing Panel for CHE

Pass/Selection	Automated Function/'*'	Command Text
—	—	MVS &EHKVAR7CHE

Keyword and Parameter Definitions

n   The number of retry attempts (*n*).

/CHE
  Code the /CHE command exactly as specified.

Comments and Usage Notes

This IMS command is issued when a normal checkpoint is required. It is only used in the XRF environment to synchronize Active and Backup checkpoints at ACORESTART via the SYNCIMS command.

&EHKVAR7 is a variable containing the console command character.

CQS0031A—Confirm CQS Restart for Structure

This keyword is used to define the reply required in response to the WTOR message CQS0031A during CQS startup.

Use reply processing on the Message Processing panel.

Table 15. Data to Be Entered in the Reply Processing Panel for CQS0031A

Pass/Selection	Retry Count	Reply Text
—	—	CONFIRM

Keyword and Parameter Definitions

CONFIRM
Code this exactly as specified.

Comments and Usage Notes

Not applicable to non-shared queue systems.

This reply is issued in response to CQS0031A WTOR informing subsys that CQS could not read the system checkpoint log token from the checkpoint data set, but found a system checkpoint log token in the control entry in the shared queues structure. Replying CONFIRM allows CQS to use the log token in the CQS0031A message (that is, the system checkpoint log token in the control entry) for restart processing.

CQS0032A—Respond to CQS Structure Restart

This keyword is used to define the reply required in response to the WTOR message CQS0032A during CQS startup.

Use reply processing on the Message Processing panel.

Table 16. Data to Be Entered in the Reply Processing Panel for CQS0032A

Pass/Selection	Retry Count	Reply Text
—	—	COLD

Keyword and Parameter Definitions

COLD
   Code this exactly as specified.

Comments and Usage Notes

Not applicable to non-shared queue systems.

This reply is issued in response to CQS0032A WTOR informing subsys that CQS could not read the system checkpoint log token from either the checkpoint data set or from the control entry in the shared queues structure. CQS does not know where to start reading from the log without the log token. Replying COLD allows CQS to begin coldstart processing.

CQS0033A—Respond to Client Takeover Restart

This keyword is used to define the reply required in response to the WTOR message CQS0033A during CQS startup.

Use reply processing on the Message Processing panel.

Table 17. Data to Be Entered in the Reply Processing Panel for CQS0033A

Pass/Selection	Retry Count	Reply Text
—	—	`COLD`

Keyword and Parameter Definitions

COLD
   Code this exactly as specified.

Comments and Usage Notes

Not applicable to non-shared queue systems.

This reply is issued in response to CQS0033A WTOR informing subsys that CQS could not read the system checkpoint log token for the CQS that was connected to the failed client from the control entry in the shared queues structure or an error prevented CQS from accessing all required log records. Replying COLD allows CQS to begin client takeover coldstart processing.

CQSET—Issue Structure Checkpoint at CQS Termination

This keyword is used to define the /CQSET command that was issued during IMS startup to cause a Structure Checkpoint at CQS shutdown.

Use command processing on the Message Processing panel.

Table 18. Data to Be Entered in the CMD Processing Panel for CQSET

Pass/Selection	Automated Function/'*'	Command Text
—	—	IMSCMD &SUBSAPPL /CQSET SHUTDOWN SHAREDQ ON STRUCTURE ALL

Keyword and Parameter Definitions

IMSCMD &SUBSAPPL /CQSET SHUTDOWN SHAREDQ ON STRUCTURE ALL
Code this exactly as specified.

Comments and Usage Notes

Not applicable to non-shared queue systems.

The command is issued during IMS startup when the IMS control region issues message DFS994I *rtype* START COMPLETED, however no action is taken until IMS shutdown. When IMS terminates normally with a /CHECKPOINT FREEZE|DUMPQ|PURGE command, IMS passes the request to CQS.

IMS Automation code will ensure that the &SUBSAPPL task global is set to the correct IMS.

IMS Automation code correlates CQS regions to IMS Control regions during IMS Control region startup.

DFS2142—Respond to Stopped Logical Link Path Message

This keyword is used to define the commands required for response to the DFS2142 message following notification that a logical link path was stopped.

Use reply processing on the Message Processing panel.

Table 19. Data to Be Entered in the Reply Processing Panel for DFS2142

	Pass/Selection	Retry Count	Reply Text
required	START	—	/START MSNAME &EHKVAR2
optional	RESTART	—	/PSTOP LINK &EHKVAR1
optional	RESTART	—	/START MSNAME &EHKVAR2
optional	RESTART	—	/RSTART LINK &EHKVAR1

Keyword and Parameter Definitions

START
> When message DFS2142 is issued, the START reply will be issued to start the logical link path.

RESTART
> When message DFS2142 is issued, the RESTART reply may optionally be issued to stop the link, start the link path and then restart the link.

/START MSNAME &EHKVAR2
> Code the /START MSNAME command exactly as specified.

/PSTOP LINK &EHKVAR1
> Code the /PSTOP LINK command exactly as specified.

/RSTART LINK &EHKVAR1
> Code the /RSTART LINK command exactly as specified.

Comments and Usage Notes

Not applicable for DB control regions.

This reply is issued in response to the DFS2142 message informing the respective subsystem that a logical link path has stopped. Issuing the /START MSNAME command will activate the link path back. For persistent occurrences of this message, stopping the link, starting the link path and then restarting the link is indicated. If this is done, it must be performed on both IMS systems.

Two variables are used to automate this response.
- &EHKVAR1 is a variable containing the logical link number.
- &EHKVAR2 is a variable containing the logical link path name.

DFS2161I—Link Stopped by Other System

This keyword is used to define the command required (for response to the DFS2161I message) following the stopping of a link by the other system attached to it.

Use reply processing on the Message Processing panel.

Table 20. Data to Be Entered in the Reply Processing Panel for DFS2161I

Pass/Selection	Retry Count	Reply Text
RESTART	—	/RSTART LINK &EHKVAR1

Keyword and Parameter Definitions

RESTART
   When message DFS2161I is issued, the RESTART reply will be issued to restart the link with the other system.

/RSTART LINK &EHKVAR1
   Code the /RSTART LINK command exactly as shown.

Comments and Usage Notes

Not applicable for DB control regions.

This reply is issued in response to the DFS2161I message informing *subsys* that a link was stopped by the IMS system at its other end. The /RSTART LINK command must be issued on both IMS systems in order to restart the link.

&EHKVAR1 is a variable containing the logical link number.

DFS2169I—Respond to MSC Link Disconnection Message

This keyword is used to define the command required (for response to the DFS2169I message) following the completion of the disconnection of a Multiple Systems Coupling (MSC) link between two IMS systems.

Use reply processing on the Message Processing panel.

Table 21. Data to Be Entered in the Reply Processing Panel for DFS2169I

Pass/Selection	Retry Count	Reply Text
RESTART	—	/RSTART LINK &EHKVAR1

Keyword and Parameter Definitions

RESTART
When message DFS2169I is issued, the RESTART reply will be issued to restart the link with the other system.

/RSTART LINK &EHKVAR1
Code the /RSTART LINK command exactly as shown.

Comments and Usage Notes

Not applicable for DB control regions.

This reply is issued in response to the DFS2169I message informing *subsys* that disconnection of a link is complete. The /RSTART LINK command must be issued on both IMS systems in order to restart the link.

&EHKVAR1 is a variable containing the logical link number.

DFS3258A—No Online Data Sets Available

This keyword is used to define the commands required (for response to the DFS3258A message) following the use of either the last OLDS or all OLDS.

Use command processing on the Message Processing panel.

Table 22. Data to Be Entered in the CMD Processing Panel for DFS3258A

Pass/Selection	Automated Function/'*'	Command Text
SYSTEM	—	*command_text_1*
LAST	—	*command_text_2*

Keyword and Parameter Definitions

SYSTEM
> When message DFS3258A is issued and there are no more available OLDS for this IMS subsystem, the SYSTEM command will be issued.

command_text_1
> The command to be executed when there are no more available OLDS.

LAST
> When message DFS3258A is issued and the IMS subsystem is using the last available OLDS, the LAST command will be issued.

command_text_2
> The command to be executed when the last available OLDS is in use.

Comments and Usage Notes

This command is issued in response to the DFS3258A message.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : DFS3258A

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text
SYSTEM____       _____
IMSCMD &SUBSAPPL /LOG WAITING_____
_____

LAST_____       _____
IMSCMD &SUBSAPPL /STA OLDS 99_____
_____
```

DFS554A—Respond to Program Abend

This keyword is used to define the commands required for response to the DFS554A message, following notification of a program abend.

Use reply processing on the Message Processing panel with the data in Table 23 or command processing with the data in Table 24.

Table 23. Data to Be Entered in the Reply Processing Panel for DFS554A—only for DC Control

Pass/Selection	Retry Count	Reply Text
TRAN	—	*command*
PROG	—	*command*

Table 24. Data to Be Entered in the CMD Processing Panel for DFS554A—for DB or DC Control

Pass/Selection	Automated Function/'*'	Command Text
TRAN	—	*command_text*
PROG	—	*command_text*

Keyword and Parameter Definitions

TRAN
> When message DFS554A is issued and the DFS554A message indicates the transaction is stopped, the TRAN reply is issued to restart the transaction.

PROG
> When message DFS554A is issued and the DFS554A message indicates the program is stopped, the PROG reply or command is issued to restart the program.

command
> Usually, you will code these commands as shown in the first example below if you are using REP.

command_text
> Usually, you will code this command as shown in the second example if you want IMS Automation to automatically start the program and you are using CMD. Note that you *must* use IMSCMD for IMS control regions in this case.

Comments and Usage Notes

For DB control regions, use command processing only. Note that transactions are not handled by DB control regions so that you need not code the row with TRAN in Table 24 for a DB control region.

This reply is issued in response to the DFS554A message issued when an IMS program abends to restart the transaction and the program.

Two variables are used to automate this response:
- &EHKVAR1 is a variable containing the transaction name.
- &EHKVAR2 is a variable containing the program name.

Four additional variables are supplied for job- or region-unique recovery that may be necessary:
- &EHKVAR3 is a variable containing job identifier.
- &EHKVAR4 is a variable containing region identifier.

- &EHKVAR5 is a variable containing user abend code.
- &EHKVAR6 is a variable containing system abend code.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : DFS554A

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
TRAN_____ __    /STA TRAN &EHKVAR1_____
PROG_____ __    /STA PGM &EHKVAR2_____
_____   __    _____
_____   __    _____
_____   __    _____
_____   __    _____
_____   __    _____
```

In this example, the REP attribute is used for the IMS control region IMSIMSZ.

```
Subsystem  : IMS01C
Message ID : DFS554A

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text
PROG_____     _____
IMSCMD &SUBSAPPL /STA PGM &EHKVAR2_____
_____

_____     _____
_____
_____
```

In this example, the CMD attribute is used for the DB control region IMS01C.

```
Subsystem  : IMSIMSA
Message ID : DFS554A

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text
TRAN_____     _____
USER REXX &EHKVAR1 &EHKVAR3_____
_____

_____     _____
_____
_____
```

In this example, a user-written recovery routine will use the job ID and transaction ID to determine the recovery actions.

DFS690A—Shut Down Dependent Regions when no Control Region Is Active

This keyword is used to define the replies required for response to the DFS690A message, following notification that a dependent region is waiting for it's control region. It is added to the MESSAGES/USER DATA policy of a dependent region. The *IMS add-on policy has this message defined in the C_IMS_APPLICATIONS class.

Use reply processing on the Message Processing panel with the data in Table 23 on page 50

Table 25. Data to Be Entered in the Reply Processing Panel for DFS690A

Pass/Selection	Retry Count	Reply Text
—	—	CANCEL

Keyword and Parameter Definitions

CANCEL
This reply is required to cancel dependent regions when the control region is not active on the system.

Comments and Usage Notes

This message and reply is recommended if your IMS control regions and dependent regions can be run on multiple systems. It will cancel dependent regions that accidentally start on a system that is not running the control region. Without this policy, the restarting of a dependent region might be compromised due to the partial startup processing of the region.

DFS810A—Define Restart Commands

This keyword is used to define the restart commands required (for response to the DFS810A message) following successful completion of IMS initialization.

Use reply processing on the Message Processing panel.

Table 26. Data to Be Entered in the Reply Processing Panel for DFS810A

Pass/Selection	Reply Text
COLD	*command*
BUILDQ	*command*
WARMSDBL	*command*
user	*command*

Keyword and Parameter Definitions

COLD
> When the operator selects a start type of COLD on the INGREQ panel, this parameter is required to define the restart command to be issued in response to message DFS810A.

BUILDQ
> When the operator selects a start type of BUILDQ on the INGREQ panel, this parameter is required to define the restart command to be issued in response to message DFS810A.

WARMSDBL
> When the operator selects a start type of WARMSDBL on the INGREQ panel (causing the MSDB to be loaded during WARM start), this parameter is required to define the restart command to be issued in response to message DFS810A.

user
> Any user-defined start type may be specified.
>
> When the operator selects a start type of "user" on the INGREQ panel, this parameter is required to define the restart command that is to be issued in response to message DFS810A.

command
> The IMS command to be issued in response to the DFS810A message. Variable &APPLPARMS will be replaced by the value specified in the Appl Parms input field of INGREQ.

Comments and Usage Notes

Not applicable for DB control regions.

These replies are issued in response to the DFS810A message requesting that an /NRESTART or /RESTART be entered.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : DFS810I

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
COLD_____  5_  /NRE CHKPT 0 FORMAT ALL DETACH_____
BUILDQ____  5_  /NRE FORMAT RS BUILDQ_____
WARMSDBL__  9_  /NRE MSDBLOAD_____
_____   __   _____
_____   __   _____
_____   __   _____
_____   __   _____
```

DFS989I—Define Restart Commands (DBCTL Only)

This keyword is used to define the restart commands required (for response to the DFS989I message) following successful completion of IMS initialization.

Use command processing on the Message Processing panel.

Table 27. Data to Be Entered in the CMD Processing Panel for DFS989I

Pass/Selection	Automated Function/'*'	Command Text
NORM	—	MVS &EHKVAR7 *command_text*
WARMSDBL	—	MVS &EHKVAR7 *command_text*
COLD	—	MVS &EHKVAR7 *command_text*
user	—	MVS &EHKVAR7 *command_text*

Keyword and Parameter Definitions

NORM

When the operator selects a start type of NORM on the INGREQ input panel, this attribute entry is required to define the restart command that is to be issued in response to message DFS989I.

COLD

When the operator selects a start type of COLD on the INGREQ input panel, this attribute entry is required to define the restart command to be issued in response to message DFS989I.

WARMSDBL

When the operator selects a start type of WARMSDBL on the INGREQ input panel, this attribute entry is required to define the restart command to be issued in response to message DFS989I.

user

Any user defined start type may be defined. When the operator selects a start type of user on the INGREQ input panel, this attribute entry is required to define the restart command to be issued in response to message DFS989I.

command_text

The IMS command to be issued in response to the DFS989I message. Refer to the example below for sample *command_text* entries.

Comments and Usage Notes

These commands are issued in response to the DFS989I message requesting that a restart command be entered. For a DBCTL region the entry for message DFS810A is not required since a DBCTL region issues message DFS989I instead of DFS810A.

The variable &EHKVAR7 contains the IMS command control character.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : DFS989I

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text
WARMSDBL__      _____
MVS &EHKVAR7NRE MSDBLOAD_____
_____


COLD_____      _____
MVS &EHKVAR7NRE CHKPT 0 FORMAT ALL_____
_____
```

DFS994I—Respond to Checkpoint Written to the IMS Log

This keyword is used to define the commands required for response to the DFS994I "*xxxx* START COMPLETED" message that follows the writing of a checkpoint to the IMS system log.

- For DC and DB control regions, use command processing on the Message Processing panel with the data in Table 28.

Table 28. Data to Be Entered in the CMD Processing Panel for DFS994I with DC and DB Control Regions

Pass/Selection	Automated Function/'*'	Command Text
—	—	IMSCMD &SUBSAPPL /STA DC
—	—	IMSCMD &SUBSAPPL /CHE

Comments and Usage Notes

For IMS DC the response to DFS994I can also be defined as replies.

HOLDQ—Issue Commands at Shutdown

This keyword is used to define the commands that may be issued at the initiation of the shutdown process and subsequent to PRECHKP.

Use command processing on the Message Processing panel.

Table 29. Data to Be Entered in the CMD Processing Panel for HOLDQ

Pass/Selection	Automated Function/'*'	Command Text
—	—	*command_text*

Keyword and Parameter Definitions

command_text
> Any appropriate MVS/JES command may be coded.

Comments and Usage Notes
⇒ **Not required**.

These MVS commands are issued at the very beginning of the shutdown process. Any appropriate MVS/JES commands may be coded; however, the original intent was to specify JES commands that would **hold** certain job classes that BMPs run in. This would prevent other BMPs from starting once the shutdown process was initiated.

Examples of Usage

```
 Subsystem  : IMSIMSZ
 Message ID : HOLDQ

 Enter commands to be executed when resource issues the selected message.

 Pass/Selection Automated Function/'*'
 Command Text

 _____  _____
 MVS $HQ,C=123_____
 _____


 _____    _____
 _____
 _____
```

IMSINFO—Display Information

These commands are issued when the INGIMS REQ=INFO command is used to display the state of the selected IMS Control or DBCTL region. The commands are issued via the IMS subsystem ID on an MVS EMCS console and the resulting messages are either displayed on the INGIMS panel or written to the users NetView console.

For further information about the INFO request, see the description of the INGIMS command in *IBM Tivoli System Automation for z/OS Operator's Commands*.

Use user processing on the *Message Processing* panel.

Table 30. Data to Be Entered in the User Defined Data Panel for IMSINFO

Keyword	Data
description	*IMS command*

Keyword and Parameter Definitions

description
> The description is text that will be placed before the output of the IMS command. This can be used to identify the command output in the output stream. The description can be any string, but must be enclosed in quotes.

IMS command
> The IMS command is the command to be executed. This command will be appended to the IMS subsystem ID and issued as an MVS command to an EMCS console. The output will be collected and displayed. The command can be any valid IMS DBCTL or Control region command. The command must be enclosed in quotes.
>
> You may code multiple IMS commands, separated by a comma, in order to group results under a common description.

Comments and Usage Notes

This policy is required for correct operation of the INGIMS command and also PF10 of the DISPINFO panel.

Examples of Usage

```
Subsystem  : IMS711C4
Message ID : IMSINFO

To change keyword-data pair, specify the following:

Keyword
Data
IMSCMD
('ACTIVE STATE','DIS A')
IMSCMD
('Comms','DIS A DC')
```

OLDS—Define Recovery Criteria for OLDS

The OLDS keyword defines automation settings for online data sets (OLDS). IMS Automation monitors the OLDS at regular intervals and notifies operators before the IMS fails. Using the OLDS entry, you specify the minimum number of OLDS that must be available at all times. If the number of available OLDS drops below that minimum, IMS Automation starts the OLDS you designate as spares. If the number of available OLDS exceeds the minimum, IMS Automation will stop unneeded OLDS. Please read the "Comments and Usage Notes" on page 61 carefully.

During normal IMS operations, the archive jobs copy data from the OLDS to the system log data sets (SLDS) to make the OLDS available for more data. When archive jobs fail, the OLDS fill up and are no longer available. IMS Automation monitors how long it takes the archive jobs to execute and notifies operators if the archive jobs are taking longer than expected to run. Additionally, IMS Automation checks that the number of OLDS data sets with an 'OTHER-STS' of 'BACKOUT' has not exceeded the value specified in the BACKOUT operand. By monitoring the archive jobs, IMS Automation helps operators detect possible problems early so they can be corrected before the OLDS fill and IMS stops.

Attention: Investigate any problems with OLDS immediately and correct. Failure to do so can cause IMS to stop.

Use action `user` on the Message Processing panel.

Table 31. Data to Be Entered in the User Defined Data Panel for OLDS

Keyword	Data
`MINIMUM`	*nn*
`SPARES`	*(nn,nn...)*
`ARCHIVETIME`	*hh:mm:ss*
`RETRYCNT`	*n*
`BACKOUT`	*nn*

Keyword and Parameter Definitions

MINIMUM=*nn*
> The minimum number of OLDS that must be available at all times. The default minimum is 50% of the *normal number* of OLDS. The normal number of OLDS display when you issue the DISPLAY OLDS command (DIS OLDS). The normal number can not be less than three and includes all OLDS that IMS started at initialization or that operators started. OLDS that are defined but are not listed in the response to the DISPLAY OLDS command are not included in calculating the normal number of OLDS.

SPARES=(*nn***,***nn***...)**
> The spares are OLDS that IMS Automation activates when the number of available OLDS drops below the minimum. The names for the spares are the two-digit numbers taken from the end of the ddname. For example, DFSOLP99 is the spare named 99. Be sure that the names of the spares match the names of existing OLDS.
>
> The data portion of this entry can be replaced by "DYNAM" and SA z/OS will attempt to discover any spares data sets that have been made available to IMS Automation. This requires that the spares are defined dynamically to IMS Automation (refer to the IMS DFSMDA macro). When IMS Automation is cold

started, the spares are discovered by SA z/OS and saved in the save/restore cache. When OLDS are required, the result of a /DIS OLDS is compared to the saved globals and treated as normal if found and spare if not.

ARCHIVETIME=*hh:mm:ss*
The archive time is the maximum length of time archive jobs take to run. Set this timer to be longer than the archive jobs take to execute. The default setting is 00:10:00 (10 minutes).

RETRYCNT=*n*
The retry count is the number of times that IMS Automation will attempt to acquire an outstanding reply ID when activating or deactivating a spare OLDS. The default is 5 retries.

BACKOUT=*nn*
The maximum number of OLDS that can have an OTHER-STS of BACKOUT. Set this number to match the total number of acceptable OLDS data sets with an OTHER-STS of BACKOUT.

Comments and Usage Notes

1. Make sure that the OLDS you designate as spares exist.

   Note: To define spares as dynamically allocated additional OLDS, preallocate and catalog candidate data sets and specify data set names using the dynamic allocation macro, DFSMDA. Provide DFSMDA members for all OLDS. For information on using DFSMDA, refer to the *IMS/ESA Utilities Reference*.

2. Do not include the spare OLDS in DFSVSM00, which is the member that tells IMS which data sets to start when IMS initializes. IMS Automation will stop any spare OLDS and remove them from SDF if the minimum number of OLDS are available.

3. If you activate a spare OLDS manually while the number of available OLDS is equal to or above the minimum, IMS Automation removes the spare from IMS and deletes any SDF entries for the spare.

   Note: IMS Automation does *not* send notifications when it stops an OLDS that is designated for use only as a spare.

4. If you define new OLDS, you must stop and restart IMS to use these settings.

5. For IMS Automation to monitor OLDS, you must define an OLDS entry.

6. The value of OLDS BACKOUT can not exceed the total number of OLDS data sets defined to the IMS subsystem. The value should represent an acceptable maximum number of OLDS data sets with an OTHER-STS of BACKOUT.

Examples of Usage

```
Subsystem  : IMS10AA
Message ID : OLDS

To change keyword-data pair, specify the following:

Keyword
Data
MINIMUM_____
5_____
_____

SPARES_____
(97,98,99)_____
_____

ARCHIVETIME_____
00:20:00_____
_____

RETRYCNT_____
7_____
_____

BACKOUT_____
2_____
_____
```

For this example, the minimum number of OLDS that must be kept available at all
times is five. If the number of available OLDS is less than five, IMS Automation
starts one of the spares (DFSOLP97, DFSOLP98, or DFSOLP99). If IMS Automation
does not receive an outstanding reply ID within seven tries, no further attempts
are made. IMS Automation also sends notifications to operators if the archive jobs
take longer than 20 minutes to execute or the total number of OLDS data sets with
an OTHER-STS of BACKOUT exceeds a maximum of 2.

POSTCHKP—Issue Commands after IMS Shutdown Checkpoint

This keyword is used to define the commands that may be issued immediately after the IMS shutdown checkpoint has been issued.

Use both reply processing on the Message Processing panel with the data in Table 32 and command processing with the data in Table 33.

Table 32. Data to Be Entered in the Reply Processing Panel for POSTCHKP

Pass/Selection	Retry Count	Reply Text
—	*n*	*ims_command*
—	*n*	*ims_command*

Table 33. Data to Be Entered in the CMD Processing Panel for POSTCHKP

Pass/Selection	Automated Function/'*'	Command Text
—	—	*command_text*
—	—	*command_text*

Keyword and Parameter Definitions

command_text
> Any appropriate command may be coded.

ims_command
> Any appropriate IMS command may be coded.

Comments and Usage Notes
⇒ **Not required**.

For DB control regions, use the **CMD=** syntax only.

Attention: Although replies are supported, their use at this point in the processing of an IMS is not recommended. Because POSTCHKP occurs after the checkpoint call has been issued, it is likely that no outstanding reply is available. Improper use of the reply function with POSTCHKP can cause performance problems.

These commands (CMD=) and IMS replies (REP=) are issued just after the IMS shutdown checkpoint has been issued. There may be multiple commands and IMS replies.

Two variables are available for use in the commands:

&EHKVAR1   This is the value of the VTAM IMS APPLID.

&EHKVAR2   This is the IMS subsystem ID (*subid*) as specified in the **IMSID** field of the IMS ENVIRON policy item.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : POSTCHKP

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text

_____  _____
MVS $AQ,C=123_____
_____


_____  _____
MVS S IMSJOB_____
_____
```

PRECHKP—Issue Commands Prior to IMS Shutdown Checkpoint

This entry defines the commands that may be issued immediately prior to the IMS shutdown checkpoint being issued but prior to HOLDQ.

Use both reply processing on the Message Processing panel with the data in Table 34 and command processing with the data in Table 35.

Table 34. Data to Be Entered in the Reply Processing Panel for PRECHKP

Pass/Selection	Retry Count	Reply Text
—	*n*	*ims_command*
—	*n*	*ims_command*

Table 35. Data to Be Entered in the CMD Processing Panel for PRECHKP

Pass/Selection	Automated Function/'*'	Command Text
—	—	*command*
—	—	*command*

Keyword and Parameter Definitions

command_text
    Any appropriate command may be coded.

ims_command
    Any appropriate IMS command may be coded.

Comments and Usage Notes

⇒ **Not required**.

For DB control regions, use the **CMD=** syntax only.

These commands (CMD=) and IMS replies (REP=) are issued just prior to the IMS shutdown checkpoint being issued. There may be multiple commands and IMS replies.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : PRECHKP

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text

_____   _____
MVS $HQ,123_____
_____


_____   _____
MVS S IMSJOB_____
_____
```

```
Subsystem  : IMSIMSZ
Message ID : PRECHKP

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
_____   5_   /STO TRAN ALL_____
_____   5_   /STO NODE ALL_____
_____  __    _____
_____  __    _____
_____  __    _____
_____  __    _____
_____  __    _____
```

This is an example for an IMS control region where CMD and REP attributes are coded.

RECONS—Set Monitoring Interval for RECONS

The RECONS keyword turns on active monitoring at regular intervals for RECONS. RECONS are critical for IMS recovery control. At the interval specified on the RECONS entry, IMS Automation checks to make sure that a spare RECON is available. If no spare is available, IMS Automation sends a notification to the operators.

IMS Automation also does the following RECONS automation:
- Informs operators when there has been a switch from one RECON to another
- Checks for exception conditions, such as I/O errors

For these automation actions, which occur in response to error messages, you do not need to code any entries in the policy database.

Use action `user` on the Message Processing panel.

Table 36. Data to Be Entered in the User Defined Data Panel for RECONS

	Keyword	Data
required	MONITOR	*hh:mm:ss*
optional	RETRY	*nn*
optional	DELAY	*nn*

Keyword and Parameter Definitions

MONITOR=*hh:mm:ss*
> The setting on the MONITOR keyword determines how often IMS Automation checks the RECONS to make sure a spare is available. If you specify 24 for hours, specify 00 for minutes and seconds. A time period of zero cannot be specified.

RETRY=*nn*
> Specify a value between 0 and 99. This value determines how many times RECONS monitoring will retry the "/RMLIST DBRC='RECON STATUS'." command after finding the spare RECONS data set in UNAVAILABLE status before issuing either the EVI830W or EVI832W error message.
>
> A value of 0 (default) indicates no retry is to be done. If a non-zero value is specified for the RETRY parameter then a non-ZERO value is required on the DELAY parameter.

DELAY=*nn*
> Specify a value between 0 and 59 (seconds). This value determines how long RECONS monitoring will wait before reissuing the '/RMLIST DBRC='RECON STATUS'." command as determined by the RETRY= parameter.
>
> A value of 0 (default) indicates no retry is to be done. If a non-zero value is specified for the DELAY parameter then a non-ZERO value is required on the RETRY parameter.

Comments and Usage Notes
1. IMS Automation does some RECONS checking even if no RECONS keyword is defined:
   - IMS Automation checks RECONS at IMS initialization by invoking the EVIECR04 module in the AT.
   - IMS Automation notifies operators when there is a switch from one RECON to another.

2. For IMS Automation to actively monitor the RECONS for spares, you must specify a monitoring interval on the RECONS keyword.

3. Occasionally the spare IMS RECONS data set returns a status of UNAVAILABLE which is only temporary. With the RETRY and DELAY parameters, the user has the option to reissue the status command to determine whether the UNAVAILABLE status is temporary or permanent, rather than issue the EVI830W or EVI832W error message immediately.

4. It is possible to define RECONS as a minor resource and control RECONS automation by setting the minor resource flags as required.

Examples of Usage

```
Subsystem  : IMS10AA
Message ID : RECONS

To change keyword-data pair, specify the following:

Keyword
Data
MONITOR_____
00:15:00_____
_____

RETRY_____
3_____
_____

DELAY_____
5_____
_____
```

In this example, IMS Automation checks the RECONS for spares every 15 minutes. When the spare IMS RECONS data set returns a status of UNAVAILABLE the status command is reissued three times every five seconds.

RELEASEQ—Issue Commands after Shutdown Completes

This keyword is used to define the commands that may be issued after IMS shutdown completion.

Use command processing on the Message Processing panel.

Table 37. Data to Be Entered in the CMD Processing Panel for RELEASEQ

Pass/Selection	Automated Function/'*'	Command Text
—	—	*command_text*

Keyword and Parameter Definitions

command_text
> Any appropriate MVS command may be coded.

Comments and Usage Notes
⇒ **Not required**.

These MVS commands are issued after an IMS control region has completed shutdown. Any appropriate MVS/JES commands may be coded, however, the original intent was to perform the reverse function of the HOLDQ commands (refer to "HOLDQ—Issue Commands at Shutdown" on page 58), that is, to release the job classes held during the shutdown process.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : RELEASEQ

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text

_____    _____
MVS $AQ,C=123_____
_____


_____    _____
_____
_____
```

RESTARTABORT—Emergency Restart Commands

This keyword is used to define the emergency restart commands required (for response to the DFS033I, DFS166, DFS0618A, DFS3131I, and DFS3626I messages) following an abort termination of the restart process.

To create the definition, select the MESSAGES/USER DATA policy item to get to the Message Processing panel. Then enter the RESTARTABORT keyword in the MESSAGE ID field.

- For IMS control regions, use reply processing on the Message Processing panel and fill in the data in Table 38.
- For DB control regions, use command processing on the Message Processing panel and fill in the data in Table 39.

Table 38. Data to Be Entered in the Reply Processing Panel for RESTARTABORT

Pass/Selection	Retry Count	Reply Text
OVERRIDE	*n*	*command*
BACKUP	*n*	*command*
ERE	*n*	*command*

Table 39. Data to Be Entered in the CMD Processing Panel for RESTARTABORT

Pass/Selection	Automated Function/'*'	Command Text
OVERRIDE	—	*command*
ERE	—	*command*

Keyword and Parameter Definitions

OVERRIDE
When messages DFS618A or DFS3626I are issued, the OVERRIDE reply will be issued for a non-XRF IMS subsystem, or an XRF IMS *active* subsystem when its partner subsystem is not currently active.

BACKUP
When messages DFS618A or DFS3626I are issued, the BACKUP reply will be issued for an XRF IMS alternate subsystem when its partner is currently active.

ERE
When messages DFS166, DFS3626I, or DFS033I are issued for an IMS subsystem and a valid checkpoint was not found during a restart, the ERE reply will be issued. ERE can be issued for DFS3626I if one of the messages DFS3131, DFS166, or DFS033 precedes it.

command
Code the *command* for OVERRIDE, BACKUP, and ERE replies as specified in the example below.

Comments and Usage Notes

This reply is issued in response to the RESTARTABORT for either the DFS0618A or DFS166 message.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : RESTARTABORT

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
OVERRIDE__  5_   /ERE OVERRIDE._____
ERE_____  5_   /ERE._____
_____    __   _____
_____    __   _____
_____    __   _____
_____    __   _____
```

This example shows an entry for an IMS control region.

SHUTTYPES—Issue Commands at Operator Shutdown

This keyword is used to specify the commands that are associated with the so-called shutdown options. One such an option must be specified in the shutdown commands under the SHUTDOWN policy item; this is the default option. You can override the default by specifying another shutdown option in the **Appl Parms** field of the INGREQ input panel. For INGREQ, see Chapter 7, "Starting and Stopping Resources," on page 107.

Use both reply processing on the Message Processing panel with the data in Table 40 and command processing with the data in Table 41.

*Table 40. Data to Be Entered in the **CMD Processing** Panel for SHUTTYPES*

Pass/Selection	Automated Function/'*'	Command Text
shutoption	*n*	*command_text*

*Table 41. Data to Be Entered in the **Reply Processing** Panel for SHUTTYPES*

Pass/Selection	Retry Count	Reply Text
NODUMP	—	*command*
DUMP	—	*command*
DUMPQ	—	*command*
PURGE	—	*command*
FREEZE	—	*command*

Keyword and Parameter Definitions

shutoption
> One SHUTTYPES entry must be specified for every IMS control region, with four REP attributes (each specifying a command for one of the shutdown options DUMPQ, BACKUP, FREEZE or PURGE), and two CMD attributes, one with DUMP and the other with NODUMP as its first value. DUMPQ and BACKUP are not applicable to DB control regions.

command,*command_text*
> The IMS command to be issued, related to the *shutoption* value specified in the REP or CMD attribute of the SHUTTYPES entry. The variable &EHKVAR1 may be used in the command; its value will be the IMS control region jobname.

Comments and Usage Notes

The IMS command issued depends on the shutdown type (NORM, IMMED or FORCE) selected for the shutdown request and on the default shutdown options specified in the commands for the different phases of the SHUTDOWN policy item; operator selection (optional) of a shutdown option on the INGREQ panel will override the default specification.

When you do a NORM or IMMED shutdown, the only options allowed are:
- For a DBCTL region: PURGE, FREEZE
- For a CTL region: PURGE, FREEZE or DUMPQ

When you do a FORCE the only options allowed are DUMP or NODUMP.

The *shutoption* parameter coded in the commands for the shutdown phases corresponds to the *shutoption* value coded in the REP or CMD attributes of the SHUTTYPES entry. For instance, consider the example below. If the operator selects

the shutdown type NORM and does not specify a shutdown option, then the /CHE DUMPQ command will be issued because the command for the NORM phase contains the DUMPQ shutdown option, and this shutdown option is associated with the /CHE DUMPQ command in the SHUTTYPES entry.

If, however, the operator overrides DUMPQ with the FREEZE shutdown option, then the command that is associated with FREEZE in the SHUTTYPES entry will be issued, that is, the /CHE FREEZE command.

For details about shutting down a subsystem from the operator interface, refer to "Shutdown" on page 108.

Do not use IMSCMD or INGIMS in the *command_text* field. IMSCMD and INGIMS issue IMS commands in a PIPE and do not expose IMS output to waiting automation routines. Thus a timeout may occur.

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : SHUTTYPES

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
DUMPQ_____   5_   /CHE DUMPQ_____
FREEZE____   5_   /CHE FREEZE_____
PURGE_____   5_   /CHE PURGE_____
_____    __    _____
_____    __    _____
_____    __    _____
```

This is the REP part of the SHUTTYPES entry for an IMS control region.

SNAPQ—Issue SNAPQ Checkpoint Command

This keyword is used to specify the IMS command to be issued when a SNAPQ checkpoint is required. The SNAPQ policy is required for XRF partner systems.

Use reply processing on the Message Processing panel.

Table 42. Data to Be Entered in the Reply Processing Panel for DFS2169I

Pass/Selection	Retry Count	Reply Text
—	*n*	/CHE SNAPQ

Keyword and Parameter Definitions

/CHE SNAPQ
>   This is the command issued when a SNAPQ checkpoint is required. Code exactly as specified.

Comments and Usage Notes

This IMS command is issued when a SNAPQ checkpoint is required.

The SNAPQ commands are invoked in the following conditions:

1. At IMS startup if in a XRF environment and the last HSBID is different to the current HSBID.
2. If message DFS3801A is issued by the IMS Control Region.

Code this entry as described above (specify number of retry attempts).

Examples of Usage

```
Subsystem  : IMSIMSZ
Message ID : SNAPQ

Enter the replies to be issued when this resource issues the selected message.

Pass/      Retry Reply Text
Selection  Count
_____    5_   /CHE SNAPQ_____
_____    __   _____
_____    __   _____
_____    __   _____
_____    __   _____
_____    __   _____
_____    __   _____
```

STOPBMPREGION—Stop Batch Message Regions

This keyword serves to define commands to stop batch message regions. It must be specified under the MESSAGES/USER DATA item of the control region associated with the BMP region. This entry is only used when the **External Shutdown** field of the **Automation Info** policy item is not set to ALWAYS for the batch message region.

In this case, shutdown commands must be defined for the batch message region in its SHUTDOWN policy item. These commands are passed a shutdown type which corresponds to a **Pass/Selection** value of the STOPBMPREGION entry. When one of these commands is issued, it invokes in its turn the command of that attribute instance of STOPBMPREGION that contains the corresponding first value. For an example of this mechanism, see "Other Region Types" on page 21.

- For IMS control regions, use reply processing on the Message Processing panel and fill in the data in Table 43.
- For DB control regions, use command processing on the Message Processing panel and fill in the data in Table 44.

Table 43. Data to Be Entered in the Reply Processing Panel for STOPBMPREGION

	Pass/Selection	**Retry Count**	**Reply Text**
Rrequired	NORMAL	*n*	/STOP REGION &EHKVAR1
Required	ABEND	*n*	/STOP REGION &EHKVAR1 ABDUMP
Required	CANCEL	*n*	/STOP REGION &EHKVAR1 ABDUMP
Required	CANCEL	*n*	/STOP REGION &EHKVAR1 CANCEL

Table 44. Data to Be Entered in the CMD Processing Panel for STOPBMPREGION

	Pass/Selection	**Automated Function/'*'**	**Command Text**
Required	NORMAL	—	*command_text*
Required	ABEND	—	*command_text*
Required	CANCEL	—	*command_text*

Keyword and Parameter Definitions

n   The number of retries.

Comments and Usage Notes

1. The first values of the CMD and REP attributes correspond to the shutdown types as follows:
   - NORMAL equates to the shutdown type NORM.
   - ABEND equates to the shutdown type IMMED.
   - CANCEL equates to the shutdown type FORCE.
2. IMS requires that a /STOP REGION *xxxx* ABDUMP be issued before a /STOP REGION *xxxx* CANCEL. Therefore, it is recommended that two CANCEL entries be coded in the STOPBMPREGION entry, the first specifying ABDUMP and the second specifying CANCEL (see the example below). Coding two CANCEL statements (as shown below) means there is some redundancy during normal SHUTDOWN escalation because the /STOP REGION *xxxx* ABDUMP will be issued for SHUTIMMED/ABEND before escalation procedes to SHUTFORCE/CANCEL.
3. STOPBMPREGION can set two &EHKVAR variables:

EHKVAR1

This is the dependent region id that can be used in a /STOP REGION id command.

EHKVAR2

This can be set to the transaction name of the transaction running on a region. It is set for TP's and BMPs and only if the region does not have a status of WAITING, WAIT-SWITCHOVER or WAIT-MESSAGE.

For BMPs this variable is conditional on the contents of the commands to be executed. There must be a /PSTOP TRANSACTION &EHKVAR2 command in the list of commands to execute.

Examples of Usage

```
Subsystem  : IMSIMSZA
Message ID : STOPBMPREGION

Enter commands to be executed when resource issues the selected message.

Pass/Selection Automated Function/'*'
Command Text
NORMAL____        _____
MVS &EHKVAR7STOP REG &EHKVAR1_____
_____

ABEND_____        _____
MVS &EHKVAR7STOP REG &EHKVAR1 ABDUMP_____
_____
CANCEL____        _____
MVS &EHKVAR7STOP REG &EHKVAR1 ABDUMP_____
_____
CANCEL____        _____
MVS &EHKVAR7STOP REG &EHKVAR1 CANCEL_____
_____
```

This is an example for a DB control region.

STOPFPREGION—Stop Fast Path Regions

This keyword serves to define commands to stop fast path regions. It must be specified under the MESSAGES/USER DATA item of the *control* region associated with the FP region. This entry is only used when the **External Shutdown** field of the **Automation Info** policy item is not set to ALWAYS for the fast path region.

In this case, shutdown commands must be defined for the fast path region in its SHUTDOWN policy item.These commands must be passed a shutdown type which corresponds to a **Pass/Selection** value of the STOPFPREGION entry. When one of these commands is issued, it invokes in its turn the command of that attribute instance of STOPFPREGION that contains the corresponding first value. For an example of this mechanism, see "Other Region Types" on page 21.

Use reply processing on the Message Processing panel.

Table 45. Data to Be Entered in the Reply Processing Panel for STOPFPREGION

	Pass/Selection	Retry Count	Reply Text
Required	NORMAL	*n*	/STOP REGION &EHKVAR1
Required	ABEND	*n*	/STOP REGION &EHKVAR1 ABDUMP
Required	CANCEL	*n*	/STOP REGION &EHKVAR1 ABDUMP
Required	CANCEL	*n*	/STOP REGION &EHKVAR1 CANCEL

Keyword and Parameter Definitions

n   The number of retries

Comments and Usage Notes

1. Not applicable for DB control regions.
2. The first values of the REP attribute correspond to the shutdown types as follows:
   - NORMAL equates to the shutdown type NORM.
   - ABEND equates to the shutdown type IMMED.
   - CANCEL equates to the shutdown type FORCE.
3. IMS requires that a /STOP REGION *xxxx* ABDUMP be issued before a /STOP REGION *xxxx* CANCEL. Therefore, it is recommended that two CANCEL entries be coded in the STOPFPREGION entry, the first specifying ABDUMP and the second specifying CANCEL. Coding two CANCEL statements means there is some redundancy during normal SHUTDOWN escalation because the /STOP REGION *xxxx* ABDUMP will be issued for SHUTIMMED/ABEND before escalation procedes to SHUTFORCE/CANCEL.

STOPREGION—Stop IMS Dependent Message Region

This keyword serves to define commands to stop dependent message regions. It must be specified under the MESSAGES/USER DATA item of the *control* region associated with the dependent message region. This entry is only used when the **External Shutdown** field of the **Automation Info** policy item is not set to ALWAYS for the dependent region.

In this case, shutdown commands must be defined for the dependent message region in its SHUTDOWN policy item. These commands must be passed a shutdown type which corresponds to the first value of an attribute of the STOPREGION entry. When one of the shutdown commands is issued, it invokes in its turn the command of that attribute instance of STOPREGION that contains the corresponding first value. For an example of this mechanism, see "Other Region Types" on page 21.

Use reply processing on the Message Processing panel.

Table 46. Data to Be Entered in the Reply Processing Panel for STOPREGION

	Pass/Selection	**Retry Count**	**Reply Text**
Required	NORMAL	*n*	/STOP REG &EHKVAR1
Required	ABEND	*n*	/STOP REG &EHKVAR1 ABDUMP &EHKVAR2
Required	CANCEL	*n*	/STOP REG &EHKVAR1 ABDUMP &EHKVAR2
Required	CANCEL	*n*	/STOP REG &EHKVAR1 CANCEL

Keyword and Parameter Definitions

n   This entry specifies that IMS Automation will retry the operation *n* times.

ABEND

This entry specifies the IMS command required to stop an IMS dependent message region when the normal stop command fails.

CANCEL

This entry specifies the IMS command required to stop an IMS dependent message region when NORMAL and ABEND stop commands fail.

NORMAL

This entry specifies the IMS command required to stop an IMS dependent message region as a normal part of the shutdown process.

Comments and Usage Notes

1. Not applicable for DB control regions.
2. Two variables are available, &EHKVAR1 and &EHKVAR2. &EHKVAR1 is a variable containing the IMS region number of the dependent region that is being stopped. &EHKVAR2 is the name of the active transaction. The variable &EHKVAR2 is only set for IMMED or FORCE types of shutdown. In addition, EVIET00J will issue a NORMAL instead of IMMED or FORCE shutdown for a transaction in any of WAITING, WAIT-SWITCHOVER, WAIT-MESSAGE states.
3. Code this entry exactly as described above.
4. IMS requires that a /STOP REGION *xxxx* ABDUMP be issued before a /STOP REGION *xxxx* CANCEL. Therefore, it is recommended that two CANCEL entries be coded in the STOPREGION entry, the first specifying ABDUMP and the second specifying CANCEL. Coding two CANCEL statements means there is some

redundancy during normal SHUTDOWN escalation because the `/STOP REGION`
xxxx `ABDUMP` will be issued for SHUTIMMED/ABEND before escalation
procedes to SHUTFORCE/CANCEL.

TCO—Issue Commands for Time-Driven Procedures

This entry allows commands to be issued to initiate, change, start, or stop time-driven procedures for any IMS operation.

Use reply processing on the Message Processing panel.

Table 47. Data to Be Entered in the Reply Processing Panel for TCO

Pass/Selection	Retry Count	Reply Text
INIT	—	DFSTCF LOAD DFSTCF .
SPEC	—	DFSTCF LOAD &EHKVAR1 .
START	—	/START LTERM DFSTCF1 .
STOP	—	/PSTOP LTERM DFSTCFI .

Keyword and Parameter Definitions

INIT
This entry specifies the IMS command required to start the initial time driven procedure DFSTCF.

SPEC
This entry specifies the IMS command required to change from the current TCO script to a script name entered from the operator interface.

START
This entry specifies the IMS command required to start TCO.

STOP
This entry specifies the IMS command required to stop TCO.

Comments and Usage Notes

1. For more information on TCO, refer to the *IMS Operations Guide*.
2. &EHKVAR1 is the name entered from the IMS Automation operator interface TCO function.

TCOMEMBERS—Define TCO Members

This keyword serves to create a list of members that appear in a pop-up IMS
Automation TCO Member Load panel. The panel is shown in the example below:

```
 EVIKMT10       IMS Automation: TCO Member Load              Page: 1 of 1
                                                             Date: 05/23/02
 Resource/Domain  => IMS711C4/APL/KEY1                       Time: 13:01
                                                             Domain: IPSNM

 TCO Status . . . . . . . : Available
        +-----------------------------------------------------------------+
 Member │ Select one of the user supplied TCO members                     │
        │  _ STRTLNES        START LINES                                   │
 Alterna│  _ ASGNTRAN        ASSIGN TRANSACTIONS                          │
        │  _ DISPROG         DISPLAY ACTIVE PROGRAMS                      │
 Maximum│                                                                 │
        │                                                                 │
        │                                                                 │
        │                                                                 │
        │                                                                 │
        │                                                                 │
        │                                                                 │
        │  F1=Help    F3=Cancel                                           │
        +-----------------------------------------------------------------+
 Command ===>
 F1=Help    F2=End     F3=Return   F4=IMS Menu            F6=Roll
```

Use user processing on the Message Processing panel.

Table 48. Data to Be Entered in the User Defined Data Panel for TCOMEMBERS

Keyword	Data
NAME	(*membername*,'*comment*')

Format

►►—TCOMEMBERS—NAME—=—(—*membername*—,—'—*comment*—'—)—————————◄◄

Keyword and Parameter Definitions

membername
  This is the 8-character name of the member previously defined in the IMS TCO
  member library. The library is associated with the DFSTCF DD statement in the
  IMS start up JCL.

comment
  This is a comment, up to 20 characters long.

Comments and Usage Notes
For more information on TCO, refer to Chapter 8, "TCO Functions," on page 111.

TCOMEMBERS

Examples of Usage

```
Subsystem  : IMS01A
Message ID : TCOMEMBERS

To change keyword-data pair, specify the following:

Keyword
Data
NAME_____
(STRTLNES,'START LINES)_____
_____

NAME_____
(ASGNTRAN,'ASSIGN TRANSACTIONS')_____
_____
```

Chapter 5. Common Routines

This chapter describes IMS Automation common routines which request information or perform tasks associated with IMS Automation. You can use these common routines in automation procedures you create. Examples, sample routines, and data area information are given to show how this might be done.

IMS Automation provides new routines to retrieve and update IMS Automation-unique information. These routines can also be used in user-written extensions of IMS Automation. The following routines are arranged alphabetically for easy reference.

Operator Commands

The following commands are operator commands and can be invoked by operators or via PIPEs.

INGIMS—Issue IMS console commands

ACF Commands

The following commands are meant to be executed from the ACF command policies.

IMSCMD—Issue IMS console commands

Application Programming Interfaces

The following commands are meant to be executed from the ACF command policies.

EVIEX002—Retrieve Subsystem Data

EVIEX003—Update Subsystem Data

IMSBMSG—Build Message Processor

IMSQRY—Name Lookup

IMSRCMD—Request an IMS function

EVIEX002—Retrieve IMS Subsystem Data

The purpose of this command is to retrieve data from the IMS subsystem information.

Syntax

EVIEX002 *subsystem,keyword1,...keywordN*

Keyword and Parameter Definitions

subsystem
> The name of the subsystem for which the information will be retrieved.

keywordN
> The name of the keyword of the data to return. The possible values are:
>
> BUILDQCKPT, DBRCRESRV, DCSTATUS, DEPREGID, ENDDT, LASTABENDCODE, RUNSTARTYPE, STARTDT, STARTTYPE, VER.
>
> For more information about the keywords, refer to common routine "EVIEX003—Update IMS Subsystem Data" on page 85.

Comments and Usage Notes

When the EVIEX002 command is issued, the values will be returned in the following task global variables:

1. EVISTSV*n*

   These variables will contain the value of the keywords in the order in which they were requested. These variables are used for any number of keywords requested. If the keyword requested is invalid, the value returned will be blanks.

2. EVISTSN

   This variable contains the value of the number of keywords requested.

Examples of Usage

The following example shows how to call EVIEX002 from within a REXX CLIST. The results (as they would appear at a NCCF operator session) are displayed after the sample CLIST.

```
/******************************************************************/
 TRACE OFF
 SAY 'THIS IS AN EXAMPLE OF A CALL TO COMMON ROUTINE EVIEX002'
 'EVIEX002 IMS05Z,STARTTYPE,RSTCKPT'
 'GLOBALV GETT EVISTSV1 EVISTSV2 EVISTSN'
 SAY 'EVISTSV1 VARIABLE IS: ' EVISTSV1
 SAY 'EVISTSV2 VARIABLE IS: ' EVISTSV2
 SAY 'EVISTSN VARIABLE IS:  ' EVISTSN
      RETURN
```

Note:

```
     Sample output
        THIS IS AN EXAMPLE OF A CALL TO COMMON ROUTINE EVIEX002
        EVISTSV1 VARIABLE IS:  AUTO
        EVISTSV2 VARIABLE IS:  93301/081251
        EVISTSN VARIABLE IS:  2
```

EVIEX003—Update IMS Subsystem Data

The purpose of this command is to update data on the IMS subsystem information.

Syntax

EVIEX003 *subsystem,keyword1=value1,...keywordN=valueN*

Keyword and Parameter Definitions

subsystem
> The name of the subsystem for which the information will be updated.

keywordN
> The name of the field to be updated.

valueN
> The value of the field to be updated.

The following keywords can be specified:

BUILDQCKPT=
> Specifies the last checkpoint ID that is valid for loading DC blocks.
>
> The value is extracted from message DSF3804I, which indicates the completion of an IMS checkpoint.
>
> The format is yyddd/hhmmss.

DBRCRESRV=
> Specifies the DBRC (IMS Database Recovery Control) reserve indicator. This will tell the old active that a reserve has been detected. The old active will then cancel its DBRC to free the reserve, allowing the new active to proceed with the takeover. The possible values are RESERVE or blank.

DCSTATUS=
> Specifies the value of the Data Communication Status field.
>
> The possible values are UP, STOPPED, or DOWN.

DEPREGID=
> Exists only for dependent regions; specifies the ID of the dependent processing region: Fast Path, Message, or Batch.

ENDDT=
> Specifies the date and time that the IMS subsystem terminated. Normally, this is when IMS shutdown message DFS994I has been processed.
>
> The format is dd/mm/yy,hh:mm:ss.
>
> The value is set to '--/--/--,--:--:--', when the termination of the IMS subsystem is initiated (due to the fact that a stop request has been issued, or when an IMS subsystem is about to abend and message DFS629I is being processed).

LASTABENDCODE=
> Specifies the abend code for the last abnormal termination of the particular IMS subsystem.

RUNSTARTTYPE=
> Specifies the last requested start type. The field is populated after receiving message DFS629I, DFS627I, or IEF450I, indicating that an IMS has terminated.

The possible values are:

AUTO
> The IMS system has been started with 'AUTO=Y'.

BUILDQ
> The IMS system has been started using the BUILDQ entry from the STARTUP policy item.
>
> A BUILDQ start implies that all messages on the queues are to be saved across restarts.

COLD
> The IMS system has been COLD started.

MANUAL
> The IMS system has been started using the IMS subsystem RESTART command, entered by the user.

WARMSDBL
> The IMS system has been started by loading the Main Storage Date Base (MSDB) during a WARM start.

STARTDT=
> Specifies the time and date when message DFS3410I has been received during IMS startup. At the same time, SERVSTARTDT is set to a value of '--/--/--,--:--:--'.
>
> The format is dd/mm/yy,hh:mm:ss.

STARTTYPE=
> Specifies the start type to be used to start the IMS system. The possible values are:

AUTO
> The IMS system will be started with 'AUTO=Y'.

BUILDQ
> The IMS system will be started using the BUILDQ entry from the STARTUP policy item.
>
> A BUILDQ start implies that all messages on the queues are to be saved across restarts.

COLD
> The IMS system will be COLD started using the 'COLD' entry from the STARTUP policy item.

MANUAL
> The IMS system will be started using RESTART commands, entered by the user.

WARMSDBL
> The IMS system will be started by loading the Main Storage Date Base (MSDB) during a WARM start.

VER=
> Specifies the IMS product version and release level executing in the particular IMS subsystem. It has the format "version.release".

Comments and Usage Notes

When the EVIEX003 command is issued, the values for the named subsystem will be changed in the status file.

No validation is performed on the values you specify. If you specify incorrect values, unpredictable results can occur.
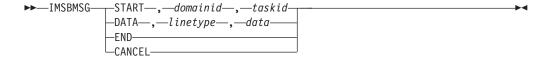
Examples of Usage

If the following statement were coded:

```
EVIEX003 IMSCTL,DCSTATUS=UP
```

The IMS subsystem information for the subsystem IMSCTL would be updated to reflect the value of UP for the data field DCSTATUS.

IMSBMSG—Build Message Processor

This processor allows programs written in REXX, NetView command lists, and high level languages to build a single or multi-line message and have it delivered to a designated task on any connected NetView domain.

```
►►──IMSBMSG──┬─START──,──domainid──,──taskid─┬──────────────────►◄
             ├─DATA──,──linetype──,──data────┤
             ├─END───────────────────────────┤
             └─CANCEL────────────────────────┘
```

The parameters are positional.

START
> This parameter is used for the first call to IMSBMSG. Parameters on the START indicate the target of the message or messages, where *domainid* is the identifier of the domain to which the message is to be routed and *taskid* is the identifier of the task on that domain. The *taskid* can be a real operator name or the name of an autotask on the receiving system.

DATA
> This identifies a user message being passed to the IMSBMSG processor where *linetype* and *data* is the message that is to be passed to the target task to which the message is to be routed. The line type of the element of a multi-line message, valid values, and their meanings are as follows.
>
> | | |
> |---|---|
> | **C** | Control line |
> | **L** | Label line |
> | **D** | Data line |
> | **E** | End line |
> | **F** | End-with-data line |
> | **S** | Single line. |
>
> If a multi-line message is to be issued, a valid combination of line types must be passed.

END
> Indicates to the IMSBMSG processor that processing is complete. It causes the processor to route previously issued data lines to the target indicated on the IMSBMSG START command. All storage obtained during processing is released. An IMSBMSG START must be issued before any other DATA items.

CANCEL
> This indicates to the IMSBMSG processor that processing is not to continue. All storage is released without any message being issued. Use CANCEL to abort the message.

Comments and Usage Notes

1. All calls must be made from the same invocation of the same program.
2. A correct sequence of line types should be passed. However, if the processor detects that a multi-line message is being passed and no E or F type has been received by the time the IMSBMSG END is received, then message **EVI698 END generated** is added to the group.
3. Single-line and multi-line messages can be mixed in the same START-END bracket.
4. The return codes are:
   0   OK.

4	Invalid type. Type should be START, DATA, END or CANCEL.
8	Invalid line type. Type should be C, L, D, E, F, or S.
12	Execution failed. A message is issued that describes the failure.
16	DATA, END or CANCEL issued without START.
20	START issued while previous start in effect.
24	Wrong number of parameters.
28	Invalid domainid. Ensure the domainid specified is correct.
32	The domain identified by domainid is not active.
36	The taskid specified is invalid or not active.
40	The value of the CGLOBAL EVI_BASE_PRODUCT is NULL or invalid.

Examples of Usage

The following example shows how to call IMSBMSG from within a REXX CLIST. The results (as shown on an operator NCCF session) follow the code sample.

```
/********************************************************************/
 TRACE OFF
 TRACE OFF
SAY 'THIS IS AN EXAMPLE OF A CALL TO COMMON ROUTINE IMSBMSG'

'IMSBMSG START,AOF05,ROMAN'
'IMSBMSG DATA,S,This is a test.................. '
'IMSBMSG END'

SAY 'RC FROM IMSBMSG IS : ' RC

 RETURN
```

Note:

```
Sample output
CLISTX
    THIS IS AN EXAMPLE OF A CALL TO COMMON ROUTINE IMSBMSG
    THIS IS A TEST..................
    RC FROM IMSBMSG IS :  0
```

Note: Data is echoed back to caller.

IMSCMD—Issue IMS Commands

IMSCMD now acts as a stub for INGIMS for compatibility. Refer to *IBM Tivoli System Automation for z/OS Operator's Commands* for information on the INGIMS command.

```
►►──IMSCMD──subsystem──IMS_command─────────────────────────────────────►◄
```

Keyword and Parameter Definitions

subsystem
> The IMS subsystem that can be controlled by the domain. It can be either a local or a remote IMS subsystem.

IMS_command
> The actual IMS command to be issued.

Comments and Usage Notes

Refer to *IBM Tivoli System Automation for z/OS Operator's Commands* for comments and usage on the INGIMS command.

Note: The IMS command prefix character ″/″ is now optional for IMSCMD. Also the IMS subsystem can be represented by a fully defined SA z/OS resource (for example, IMS811C4/APL/SYS1).

Examples of Usage

IMSCMD IMSCTL DIS A DC

```
DFS4444I DISPLAY FROM ID=M911
    VTAM STATUS AND ACTIVE DC COUNTS
    VTAM ACB OPEN          -LOGONS ENABLED
    IMSLU=N/A.N/A           APPC STATUS=DISABLED  TIMEOUT=   0
    OTMA GROUP=N/A       STATUS=NOTACTIVE
    APPC/OTMA SHARED QUEUE STATUS - LOCAL=INACTIVE    GLOBAL=INACTIVE
    APPC/OTMA RRS MAX TCBS -   40 ATTACHED TCBS -    1 QUEUED RRSWKS-
      0
    APPLID=IPSAMI91  GRSNAME=         STATUS=DISABLED
    LINE ACTIVE-IN -    1 ACTIV-OUT -    0
    NODE ACTIVE-IN -    0 ACTIV-OUT -    0
    *05237/075227*
*** END OF DISPLAY ***
```
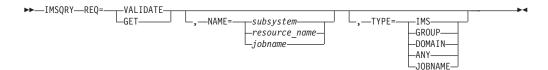
IMSQRY—Name Lookup

Use this routine to retrieve IMS subsystem information.

Note that IMSQRY does not recognize subsystems that are in FALLBACK or MOVED status.

```
►►──IMSQRY──REQ=──┬─VALIDATE─┬──┬──────────────────────────┬──┬──────────────────────┬──►◄
                  └─GET──────┘  │  ┌─subsystem─────┐        │  │        ┌─IMS──────┐  │
                  ,──NAME=──────┼──┤─resource_name─┤──      ,──TYPE=─────┼─GROUP────┤
                                   └─jobname───────┘                     ├─DOMAIN───┤
                                                                         ├─ANY──────┤
                                                                         └─JOBNAME──┘
```

Keyword and Parameter Definitions

REQ=
   The request type. The request types are:
   VALIDATE
   IMS Automation searches for the name (NAME=) and type (TYPE=) specified to validate the name.
   GET
   IMS Automation searches for a specific IMS subsystem to retrieve the subsystem characteristics. NAME= is valid with this request.

NAME={*subsystem* | *resource_name* | *jobname***}**
   Used with VALIDATE to provide a specific subsystem, resource or job name for the search. Used with GET to provide a specific subsystem value. Valid values for the NAME= variables are:

   subsystem   The name by which an IMS subsystem is known to SA z/OS

   resource_name   The resource name in the *name*/APL/*system* format. Thus, the type must be APL; APG, for example, is not valid.

   jobname   The jobname by which an IMS subsystem is known to SA z/OS.

TYPE=
   Used to provide a specific type. The types are:
   IMS
   Search for a specific IMS subsystem name, as it is known to SA z/OS. This is the default type. IMS is used with VALIDATE.
   ANY
   Search for an IMS name first, then a domain, then a group name. If the name is longer than 5 characters the search for a domain is bypassed. ANY is used with VALIDATE.
   DOMAIN
   The NetView domain name coded in DSIDMNK with the NCCFID parameter.

   Note: For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.
   GROUP
   If you specify GROUP, IMSQRY returns the name of the group to which the subsystem belongs in the EVILOOKUP_GROUP variable.
   JOBNAME
   Used with GET to provide a specific jobname. Works only when NAME=jobname.

Comments and Usage Notes

1. Valid IMSQRY return codes include:

RC	Meaning
0	Good.
4	An internal error occurred.
8	A timeout occurred on a request forwarded to a remote system.
12	An internal error occurred.
20	A subsystem, group, or domain was not found for the search criteria specified.
24	The parameters for this request are invalid.
28	An internal error occurred.
32	Unsupported function.
36	Resource name is ambiguous (more than one resource of the same name exists within the sysplex but none are defined on the local system).
40	System name where the IMS resource resides is not unique within the enterprise.
44	The IMS resource is not unique within the enterprise and its resource tree contains more than one MOVE vgroup (MOVE groups within MOVE groups are not supported by IMSQRY).

2. The following are set in the caller's variable pool:

   EVILOOKUP_NAME
   > Set to the value of the NAME= parameter, otherwise set to null.

   EVILOOKUP_TYPE
   > Set to the value of the TYPE= parameter, unless TYPE=ANY in which case it is set to IMS or DOMAIN or GROUP as appropriate.

   EVILOOKUP_JOBNAME
   > The jobname associated with the subsystem.

   EVILOOKUP_DOMAIN
   > The NetView domain on which the SA z/OS managing this subsystem is running.

   EVILOOKUP_AUTOOPS
   > The NetView automated operator that handles automation for this subsystem.

   EVILOOKUP_USERVAR
   > The VTAM USERVAR (or generic application ID) associated with this subsystem. This is set to '********' if a VTAM USERVAR is not defined.

   EVILOOKUP_SUBTYPE
   > The value of the **Subtype** field in the IMS ENVIRON policy item .

   EVILOOKUP_APPLID
   > The specific VTAM application ID associated with this subsystem.

   EVILOOKUP_RESHOME
   > The location of the resource in the following format:
   >
   > *sysplex.domain.system\VxRyMz*

   EVILOOKUP_RESLIST
   > The resource name in the following format
   >
   > *name/type/system*

EVILOOKUP_AGENTDATA
>   Information about the agent responsible for the subsystem in the
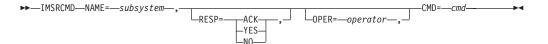>   following format
>
>   *agent_name sysplex_name system domain agent_version* [*NetView_version*]

EVILOOKUP_GROUP
>   The name of the group(s) to which the resource belongs.

IMSRCMD—Request an IMS Function

This common routine is used to perform the requested function (CMD=) on the domain where the named IMS resides, whether local or remote. The calling program does not have to be aware of where the IMS resides. It is particularly useful with single-point-of-control as IMSRCMD first determines the domain in which the subsystem resides before building and issuing the request. It then either calls the requested function if the subsystem is on the local domain, or it forwards the command to the remote domain, thus allowing cross-domain communications.

```
►►──IMSRCMD──NAME=──subsystem──,──────────────────────────────────────────CMD=──cmd──────────►◄
                          └─RESP=──┬─ACK─┬──,─┘   └─OPER=──operator──,─┘
                                   ├─YES─┤
                                   └─NO──┘
```

Keyword and Parameter Definitions

NAME=
> The name by which the target IMS subsystem is known to SA z/OS, as defined in the APPLICATION policy object.

RESP=
> Send back a response (YES or NO) or just send an acknowledgement (ACK).

OPER=
> The operator, on the target domain, that will execute this command. If this is omitted, the work operator assigned to the subsystem will be used.

CMD=
> The requested function to be performed. This may be delimited by single quotes, double quotes, or slashes.

Comments and Usage Notes

The return codes are:

RC	Meaning
0	Good
4	Subsystem name was not supplied
8	Function to be performed was not supplied
12	Incorrect keyword supplied
16	Incorrect parameter for RESP supplied
20	Subsystem was not found on any domain

INGIMS—Issue List of Defined Transactions and View the Output

The INGIMS command lets you:

- Issue any console-enabled IMS command
- Broadcast messages to all or selected IMS users
- Issue a list of defined transactions and view the output
- Display the output of IMS transactions in full-screen or pipeable line mode

For a detailed description of the INGIMS command, refer to *IBM Tivoli System Automation for z/OS Operator's Commands*.

INGIMS

Part 3. Using IMS Automation

This part describes the tasks of the operator who manages IMS subsystems through IMS Automation.

Chapter 6. Using Panels and Working with Subsystems

This chapter explains how to use the IMS Automation panels and to work with subsystems. We assume that you have used and are familiar with the SA z/OS operator interface. This chapter is devoted to describing those characteristics unique to IMS Automation. We try to provide plentiful details to guide you. But to thoroughly understand your role as the IMS Automation operator, you will need some hands-on experience with SA z/OS.

Using IMS Automation Panels

This section explains:
- Panel characteristics
- How to select tasks from panels
- How to use panel fields and function (F) keys
- Options available from the Main Menu.

To start an IMS Automation operator session and display the IMS Automation Main Menu, enter **IMS** on a NetView command line.

Panel Characteristics

All IMS Automation panels have similar characteristics, as illustrated in Figure 13.
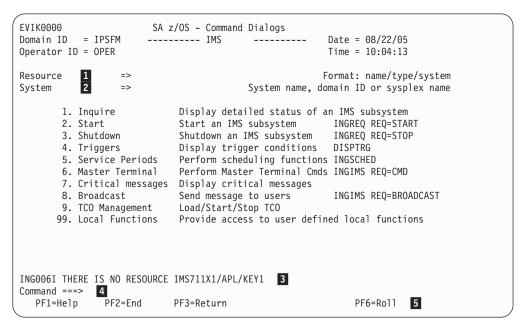
```
EVIK0000                  SA z/OS - Command Dialogs
Domain ID  = IPSFM     ---------- IMS     ----------     Date = 08/22/05
Operator ID = OPER                                       Time = 10:04:13

Resource    1      =>                            Format: name/type/system
System      2      =>                    System name, domain ID or sysplex name

      1. Inquire          Display detailed status of an IMS subsystem
      2. Start            Start an IMS subsystem       INGREQ REQ=START
      3. Shutdown         Shutdown an IMS subsystem    INGREQ REQ=STOP
      4. Triggers         Display trigger conditions   DISPTRG
      5. Service Periods  Perform scheduling functions INGSCHED
      6. Master Terminal  Perform Master Terminal Cmds INGIMS REQ=CMD
      7. Critical messages Display critical messages
      8. Broadcast        Send message to users        INGIMS REQ=BROADCAST
      9. TCO Management   Load/Start/Stop TCO
     99. Local Functions  Provide access to user defined local functions




ING006I THERE IS NO RESOURCE IMS711X1/APL/KEY1    3
Command ===>    4
  PF1=Help      PF2=End      PF3=Return                      PF6=Roll   5
```

Figure 13. Common Characteristics of IMS Automation Panels

The list below identifies common characteristics of IMS Automation panels:

1   In this field, you must specify the resource you will work with. Most of the IMS Automation panels have this field, allowing you to change resources without having to return to the main menu.

By entering a question mark ('?') at position one of the **Resource** field and pressing ENTER, you can call a list of all IMS control regions from the current sysplex that are defined to SA z/OS. You can then select a

subsystem from this list. To get this list for another sysplex other than the current one, specify the respective sysplex in the **System** field, before you press ENTER.

Note however that many of the menu options are not valid for remote sysplexes.

2　　In this field, you can specify the system, domain, or sysplex to which the command that you call by selecting an option is to be routed. If you specify a sysplex name and then enter a question mark in the **Resource** field you call a list of all the IMS control regions in the specified sysplex. For the current sysplex, you need not enter the sysplex name.

3　　IMS Automation messages display here.

4　　From the command line, you can enter IMS Automation operator commands, as well as any other command that can be entered from a NetView panel. You also select from the current menu by entering the option number in the command line.

5　　You use the function keys primarily to navigate through the panels. Each function key has a self-explanatory label. However, if you see an unfamiliar function key, refer to the panel help information by pressing PF1.

Using the Main Menu

The main menu panel lists all of the tasks available with the operator interface.

```
EVIK0000                   SA z/OS - Command Dialogs
Domain ID  = IPSFM     ---------- IMS     ----------     Date = 08/22/05
Operator ID = OPER                                       Time = 10:04:13

Resource        =>                              Format: name/type/system
System          =>                        System name, domain ID or sysplex name

       1. Inquire           Display detailed status of an IMS subsystem
       2. Start             Start an IMS subsystem       INGREQ REQ=START
       3. Shutdown          Shutdown an IMS subsystem    INGREQ REQ=STOP
       4. Triggers          Display trigger conditions   DISPTRG
       5. Service Periods   Perform scheduling functions INGSCHED
       6. Master Terminal   Perform Master Terminal Cmds INGIMS REQ=CMD
       7. Critical messages Display critical messages
       8. Broadcast         Send message to users        INGIMS REQ=BROADCAST
       9. TCO Management    Load/Start/Stop TCO
      99. Local Functions   Provide access to user defined local functions




ING006I THERE IS NO RESOURCE IMS711X1/APL/KEY1
Command ===>
  PF1=Help    PF2=End     PF3=Return                     PF6=Roll
```

Figure 14. IMS Automation Main Menu

The following list describes the options you can select from the main menu:

Inquire
　　　　Use this option to retrieve detailed information for an IMS resource. See "Getting Detailed Status" on page 103.

Start　Use this option to initiate the startup process of a resource. By choosing this option you call the INGREQ command of SA z/OS. See "Start" on page 107.

Shutdown
Use this option to initiate the shutdown process of a resource. By choosing this option you call the INGREQ command of SA z/OS. See Chapter 7, "Starting and Stopping Resources," on page 107.

Triggers
Use this option if you want to display the triggers associated with a resource. By choosing this option you call the DISPTRG command of SA z/OS. See *IBM Tivoli System Automation for z/OS Operator's Commands*.

Service Periods
Use this option if you want to display or override the schedule associated with a resource. By choosing this option you call the INGSCHED command of SA z/OS. See *IBM Tivoli System Automation for z/OS Operator's Commands*.

Master Terminal
Use this option to issue a command to a specific subsystem. By choosing this option you call the INGIMS REQ=CMD command. See *IBM Tivoli System Automation for z/OS Operator's Commands* for details.

Critical Messages
This facility displays critical messages in a scrollable format. Once displayed, messages can be deleted. See Chapter 9, "Displaying Critical Messages," on page 119.

Broadcast
Use this option to send a message to a specific subsystem. By choosing this option you call the INGIMS REQ=BROADCAST command of SA z/OS. See *IBM Tivoli System Automation for z/OS Operator's Commands* for details.

TCO Management
Use this option to manage the TCO functions of a specific subsystem. See Chapter 8, "TCO Functions," on page 111 for details.

Local Functions
IMS Automation allows your system programmer to add functions to this operator interface. If functions have been added at your installation, you would select this option to view a menu of them.

> **Important**
> The options 1 (Inquire) and 6 through 99 are only valid for the local sysplex. You cannot access a remote sysplex with any of these functions.

Using Fast Path

IMS Automation offers a *fast path* option that lets you go directly to any panel in its interface from NetView. Panels have identifying numbers based on their option number from the main menu. You *fast path* by entering a panel's identifying number on the command line. Several of the second-level panels have numbered menu options on them which take you to third-level panels. To get to the second-level panels, add a period and the number of the selection. The format to access third-level panels is *num.num.num*.

A fast path to the main menu is defined to a function key. You can return to the main menu panel from other panels by pressing PF4.

To fast path to an IMS Automation panel from NetView, enter:

```
    IMS nn
or
    IMS subsys
or
    IMS nn,subsys
```

on the command line, where *nn* is the number corresponding to the option panel and *subsys* is the name of the IMS subsystem you want to work with.

Example
Entering `IMS 9.1,IMS10AA`

will take you from NetView into IMS Automation to the **Program-to-Program Interface** panel, with the subsystem IMS10AA specified.

Selecting and Viewing Subsystems

This section explains how to select a resource from a list of available resources and how to display detailed information about a subsystem.

Selecting a Subsystem

You can specify the resource you want to work with by simply entering its name in the **Subsystem** or **Resource** field of the respective panel. On the IMS-specific panels you can call up a list of the available IMS control regions by entering a question mark at position one of the **Subsystem** or **Resource** field. On the panels that belong to basic SA z/OS commands (INGREQ, INGSCHED, DISPTRG), you can use an asterisk (*) as a wildcard.

Figure 15 shows a list of IMS control regions generated with the question mark function.

```
 INGKYSTS               SA z/OS - Command Dialogs    Line  1   of 34
 Domain ID   = IPSFM    ----- Selection Panel ------    Date = 08/22/05
 Operator ID = SCHR          Sysplex = KEY1PLEX         Time = 06:27:50

 CMD: S Select                                              / scroll
 CMD Name       Type System   Compound     Desired      Observed   Nature
 --- ----------- ---- -------  ------------ -----------  ---------- --------
 s   IMS641C4   APL  KEY2     INHIBITED    AVAILABLE    UNKNOWN
     IMS711C4   APL  KEY1     INAUTO       UNAVAILABLE  STARTING
     IMS711DL   APL  KEY1     INAUTO       AVAILABLE    STARTING
     IMS711F1   APL  KEY1     SATISFACTORY UNAVAILABLE  SOFTDOWN
     IMS711M1   APL  KEY1     SATISFACTORY UNAVAILABLE  SOFTDOWN
     IMS711RC   APL  KEY1     INAUTO       AVAILABLE    STARTING
     IMS712CX   APL  KEY1     SATISFACTORY AVAILABLE    AVAILABLE
     IMS712DL   APL  KEY1     SATISFACTORY AVAILABLE    AVAILABLE
     IMS712F1   APL  KEY1     PROBLEM      UNAVAILABLE  HARDDOWN
     IMS712M1   APL  KEY1     PROBLEM      UNAVAILABLE  HARDDOWN
     IMS712RC   APL  KEY1     SATISFACTORY AVAILABLE    AVAILABLE
     IMS713C4   APL  KEY1     AWAITING     UNAVAILABLE  AVAILABLE
     IMS713DL   APL  KEY1     INAUTO       UNAVAILABLE  STOPPING

 Command ===>
```

Figure 15. Selection Panel for IMS Resources

The list contains all IMS subsystems of the KEY1PLEX sysplex (see line 3 of the panel) that are defined to SA z/OS. You can use it not only to select a subsystem (by entering `s` in the **CMD** column), but also to get an overview of the sysplex. Columns 5 through 7, for example, contain status information for the subsystems;

for more details on the different status types, see *IBM Tivoli System Automation for z/OS User's Guide*. You can scroll horizontally through the list to the right by pressing PF11, and to the left by pressing PF10. The first three colums, which make up the resource name of the subsystem, are fixed.

Getting Detailed Status

To view in detail the status of a specified subsystem, select option **1** on the main menu panel to display the following **Inquire Subsystem Components** panel:

```
EVIKQ100        IMS Automation: Inquire Subsystem Components  Page:  1 of  1
                                                              Date: 07/28/05
Resource/Domain  => IMSCTL/APL/KEY4             (? for list) Time: 17:39
                                                            Domain: IPSFP


Select an option . . . . .    1  Detailed Subsystem status
                              2  Defined dependent Regions
                              3  Active dependent Regions
                              4  Shutdown status
                              5  Explanation of Takeover reason code
```

Figure 16. Inquire Subsystem Components Panel

From this screen, you can select the type of status display desired. The options are:

Detailed Subsystem status
Displays detailed status of the specified resource and domain. See Figure 17 on page 104 for an IMS control region example, or Figure 18 on page 104 for a DB control region example.

Defined dependent Regions
Displays the dependent regions as defined in the policy database for the specified subsystem and the status of each.

Active dependent Regions
Invokes the Subsystem/Active Regions Display panel, which lists the subsystem status, any active regions, jobnames, and tasknames.

This screen contains an extra refresh key, PF5. Pressing PF5 sets the screen to update displayed information approximately every ten to twelve seconds. Pressing PF5 a second time stops the refresh cycle.

Shutdown status
Invokes the **Shutdown Status Display** panel, which lists the active elements, either nodes (terminals), lines, or links during shutdown processing.

Explanation of Takeover reason code
Displays the reason code and explanation for a takeover.

You can display the detailed status for another resource or domain by entering the resource or domain name, selecting option 1 and pressing ENTER.

```
EVIKQI00        IMS Automation: Subsystem Information
                                                       Date: 08/22/05
Resource/Domain  => IMS721C4/APL/KEY2          (? for list) Time: 15:12
                                                     Domain:

Subsystem status . . : UP            Since . . . . . : 11:11    08/22/05
Job  . . . . . . . . : IMS721C4      Job number  . . :
NetView domain . . . : IPSFN         CQS name  . . . :

VTAM information
  Specific appl. name: IPSANI71      DC status . . . : DOWN
  Generic appl. name : IPSANI71      XRF . . . . . . :
  Active sessions  . :               XRF mode  . . . :
  Pending sessions . :               XRF status  . . :

Last start                           Last shutdown
  Initiated : 11:08:12   08/22/05     Initiated . . : 09:21:44    09/05/04
  Completed : --:--:--    --/--/--     Completed . . : 07:44:33    09/15/04
  Start type: AUTO                     Abend code  . :
Next start  : NONE     NONE         Next shutdown   : NONE      NONE

Command ===>
F1=Help      F2=End      F3=Return    F4=IMS Menu  F5=Refresh   F6=Roll
```

Figure 17. Detailed Subsystem Information Panel for an IMS Control Region. If the startup or shutdown occurred while NetView was up and running, the "Last start" and "Last shutdown" data will be accurate. If NetView was not running when the startup/shutdown occurred, the data may be inaccurate.

```
EVIKQID0            IMS Automation: Subsystem Information    Page:  1 of 1

                                                       Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 17:04:00
                                                     Domain: IPSNM
Subsystem status . . : UP            Since . . . . . : 16:42    10/10/98
Job  . . . . . . . . : IMS401C       Job number  . . : 9843
NetView domain . . . : AOF01         IMSID . . . . . : I41C
Command Character  . : ?




Last start                           Last shutdown
  Initiated : 16:40:28   08/10/05     Initiated . . : 17:06:00    08/05/05
  Completed : 16:42:35   08/10/05     Completed . . : 17:07:56    08/05/05
  Start type: AUTO                     Abend code   :

Next start  :          none         Next shutdown   :          none

Command ===>
F1=Help      F2=End      F3=Return    F4=IMS Menu  F5=Refresh   F6=Roll
```

Figure 18. Detailed Subsystem Information Panel for a DB Control Region. If the startup or shutdown occurred while NetView was up and running, the "Last start" and "Last shutdown" data will be accurate. If NetView was not running when the startup/shutdown occurred, the data may be inaccurate.

To display any regions that are defined to the subsystem, select option 2 from the Inquire Subsystems Components panel. Figure 19 on page 105 shows the panel for an IMS control region, and Figure 20 on page 105 shows the panel for a DB control region.

```
EVIKQA00   IMS Automation: Subsystem/Defined Regions Display   Page:   1 of   1
                                                               Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1            (? for list) Time: 17:04:30
                                                             Domain: IPSNM
 Subtype: CTL       Subsystem: IMS10A1   JOB: IMS10AA      Status: UP
 Outstanding Reply: 11       AVM: ON      XRF: YES     DC Status: UP
 XRF Mode: ACTIVE   XRF Status: ACTIVE        ALTSYS: ON    Last HSBID: 1
-------------------------------------------------------------------------------
Subtype Region    Job       Status        Subtype Region    Job       Status
------- --------- --------  ----------     ------- --------- --------  --------
DBRC    DBRIMSAA  DBRIMSAA  UP            |
DLS     DLIIMSAA  DLIIMSAA  UP            |
TP      MSGIMSAA  MSGIMSAA  UP            |
TP      MSGIMSAB  MSGIMSAB  UP            |
TP      MSGIMSAC  MSGIMSAC  UP            |
FP      FPIMSA1   FPIMSA1   STOPPED       |
BMP     BMPIMSA1  BMPIMSA1  STOPPED       |
                                         |
                                         |
                                         |
                                         |
                                         |
Command ===>
 F1=Help    F2=End      F3=Return   F4=IMS Menu   F5=Refresh   F6=Roll
```

Figure 19. Subsystem/Defined Regions Display Panel for an IMS Control Region

All defined regions display whether or not they are currently active. In Figure 19, the subsystem is IMS10A1 and the job is IMS10AA. For each region, the panel displays the subtype, region, job name, and status. Subtypes include:

DBRC Database recovery control region
DLS DL/I Address Space
TP Normal online message region (transaction processing)
FP Fast path message region
BMP Batch message processing region

```
 EVIKQAD0   IMS Automation: Subsystem/Defined Regions Display   Page:   1 of   1
                                                               Date: 08/22/05
                                                               Time: 17:04:30
  Subtype: CTL       Subsystem: IMS01C    JOB: IMS401C    Status: UP
  IMSID:   I41C      Command Character: ?


 -------------------------------------------------------------------------------
 Subtype Region    Job       Status        Subtype Region    Job       Status
 ------- --------- --------  ----------     ------- --------- --------  --------
 DBRC    DBRIMSC   DBRIMSC   UP            |
 DLS     DLIIMSC   DLIIMSC   UP            |
 BMP     BMPIMSA1  BMPIMSA1  STOPPED       |
 BMP     BMPIMSCA  BMPIMSCA  STOPPED       |
 BMP     BMPIMSCB  BMPIMSCB  STOPPED       |
 BMP     BMPIMSCC  BMPIMSCC  UP            |
                                          |
                                          |
                                          |
                                          |
                                          |
 Command ===>
  F1=Help    F2=End      F3=Return   F4=IMS Menu   F5=Refresh   F6=Roll
```

Figure 20. Subsystem/Defined Regions Display Panel for a DB Control Region

To display only the dependent regions that are currently active, select option 3 from the Inquire Subsystems Components panel. Figure 21 on page 106 shows the

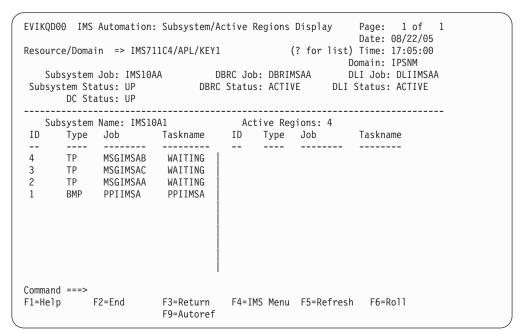panel for an IMS control region, and Figure 22 shows the panel for a DB control region.

```
  EVIKQD00  IMS Automation: Subsystem/Active Regions Display    Page:   1 of   1
                                                                Date: 08/22/05
  Resource/Domain  => IMS711C4/APL/KEY1             (? for list) Time: 17:05:00
                                                                Domain: IPSNM
      Subsystem Job: IMS10AA         DBRC Job: DBRIMSAA      DLI Job: DLIIMSAA
   Subsystem Status: UP            DBRC Status: ACTIVE     DLI Status: ACTIVE
          DC Status: UP
  --------------------------------------------------------------------------------
      Subsystem Name: IMS10A1                 Active Regions: 4
   ID    Type   Job        Taskname    ID    Type   Job        Taskname
   --    ----   --------   ---------   --    ----   --------   --------
   4     TP     MSGIMSAB   WAITING     |
   3     TP     MSGIMSAC   WAITING     |
   2     TP     MSGIMSAA   WAITING     |
   1     BMP    PPIIMSA    PPIIMSA     |
                                       |
                                       |
                                       |
                                       |
                                       |
                                       |
                                       |
  Command ===>
  F1=Help     F2=End       F3=Return   F4=IMS Menu F5=Refresh   F6=Roll
                           F9=Autoref
```

Figure 21. Subsystem/Active Regions Display for an IMS Control Region

```
  EVIKQDD0  IMS Automation: Subsystem/Active Regions Display    Page:   1 of   1
                                                                Date: 08/22/05
                                                                Time: 17:05:00
      Subsystem Job: IMS401C         DBRC Job: DBRIMSC       DLI Job: DLIIMSC
   Subsystem Status: UP            DBRC Status: ACTIVE     DLI Status: ACTIVE
   Command Character: ?

  --------------------------------------------------------------------------------
      Subsystem Name: IMS401C                 Active Regions: 1
   ID    Type   Job        Taskname    ID    Type   Job        Taskname
   --    ----   --------   ---------   --    ----   --------   --------
   1     BMP    BMPIMSCC   WAITING     |
                                       |
                                       |
                                       |
                                       |
                                       |
                                       |
                                       |
  Command ===>
  F1=Help     F2=End       F3=Return   F4=IMS Menu F5=Refresh   F6=Roll
                           F9=Autoref
```

Figure 22. Subsystem/Active Regions Display for a DB Control Region

Chapter 7. Starting and Stopping Resources

IMS Automation uses the INGREQ command of SA z/OS for starting and stopping resources. For information on INGREQ, see *IBM Tivoli System Automation for z/OS Operator's Commands*. In this section, only the special points you have to observe when starting or stopping an IMS resource will be described in detail.

To select a resource, refer to "Selecting a Subsystem" on page 102.

Start

When you select option 2, Start, from the main menu panel, the INGREQ command dialog of SA z/OS is displayed.

```
 INGKYRU0                   SA z/OS - Command Dialogs
 Domain ID   = IPSFM     ---------- INGREQ  ----------    Date = 08/22/05
 Operator ID = SCHR                                       Time = 11:39:44

   Resource    =>  IMS711C4/APL/KEY1                 format: name/type/system
   System      =>              System name, domain ID or sysplex name

   Request     => START      Request type (START, UP or STOP, DOWN)
   Type        => NORM       Type of processing (NORM/IMMED/FORCE/user) or ?
   Scope       => ONLY       Request scope (ONLY/CHILDREN/ALL)
   Priority    => LOW        Priority of request (FORCE/HIGH/LOW)
   Expire      =>        ,          Expiration date(yyyy-mm-dd), time(hh:mm)
   Timeout     => 0    / MSG    Interval in minutes / Option (MSG/CANCEL)
   AutoRemove  =>                     Remove when (SYSGONE, UNKNOWN)
   Restart     => NO         Restart resource after shutdown (YES/NO)
   Override    => NO                      (ALL/NO/TRG/FLG/DPY/STS/UOW/INIT)
   Verify      => YES        Check affected resources (YES/NO/WTOR)
   Precheck    => YES        Precheck for flags and passes (YES/NO)
   Appl Parms  =>


 Command ===>
   PF1=Help     PF2=End     PF3=Return                    PF6=Roll
                                                          PF12=Retrieve
```

Figure 23. Input Panel for the INGREQ Command

The IMS-specific features concern the **Type** and the **Appl Parms** fields:

Type   In this field, you can specify the startup type. The IMS-specific values are:

Startup Type	Explanation
AUTO	Uses the restart data set to determine the startup type.
BUILDQ	All messages on the queues are saved across restarts.
COLD	Initiates a cold start.
NORM	This is the default. It is specified in the **Default start type** field of the IMS-specific IMS ENVIRON policy item of the respective application.
WARMSDBL	Loads the Main Storage Data Base (MSDB) during a warm start.

Startup Type	Explanation
User	Uses user-defined entries in the STARTUP policy item to determine the startup type.

Appl Parms

In this field, you can pass IMS-specific information to IMS. The specified value is available in variable &APPLPARMS during the startup phase processed by SA z/OS. Therefore this variable can be used when defining start or stop commands and commands or replies in response to incoming messages during the startup phase.

If you have not changed the default value of YES for the **Verify** field, IMS Automation will display a verification panel (see Figure 24) after you have pressed ENTER. This panel displays the target resource and in addition all the resources which SA z/OS will try to start because the startability of the selected resource directly or indirectly depends on them.

```
AOFKVFY1                    SA z/OS - Command Dialogs      Line  1    of 3
Domain ID   = IPSFM      ---------- INGREQ  ----------     Date = 08/22/05
Operator ID = SCHR                                         Time = 12:34:11

 Verify list of affected resources for request START

CMD: S show overrides   T show trigger details   V show votes
Cmd Name         Type System   TRG SVP  W  Action Type      Observed Stat
--- ----------- ---- -------- --- ---- -  ------ -------- -------------
    IMSIMSZ      APL  KEY2              Y         AUTO     UNAVAILABLE
    JES2         APL  KEY2                        AUTO     UNAVAILABLE
    VTAM         APL  KEY2                        AUTO     UNAVAILABLE






Command ===>
 PF1=Help  PF2=End    PF3=Return                              PF6=Roll
                                  PF10=GO    PF11=CANCEL   PF12=Retrieve
```

Figure 24. Verification Panel for INGREQ

For more information on the verification panel of INGREQ, see *IBM Tivoli System Automation for z/OS Operator's Commands*.

Note: For starting message regions, use the INGLIST command of SA z/OS.

Shutdown

If you select option 3, Shutdown, from the main menu panel, the INGREQ command dialog of SA z/OS is displayed.

```
INGKYRU0                  SA z/OS - Command Dialogs
Domain ID   = IPSFM     ---------- INGREQ  ----------    Date = 08/22/05
Operator ID = SCHR                                       Time = 16:43:22

  Resource    =>  IMSIMSZ/APL/KEY2                 format: name/type/system
  System      =>                 System name, domain ID or sysplex name

  Request     => STOP        Request type (START, UP or STOP, DOWN)
  Type        => NORM        Type of processing (NORM/IMMED/FORCE/user) or ?
  Scope       => ONLY        Request scope (ONLY/CHILDREN/ALL)
  Priority    => LOW         Priority of request (HIGH/LOW)
  Expire      =>          ,          Expiration date(yyyy-mm-dd), time(hh:mm)
  Timeout     => 0   / MSG     Interval in minutes / Option (MSG/CANCEL)
  AutoRemove  =>                      Remove when (SYSGONE, UNKNOWN)
  Restart     => NO          Restart resource after shutdown (YES/NO)
  Override    => NO                     (ALL/NO/TRG/FLG/DPY/STS/UOW/INIT)
  Verify      => YES         Check affected resources (YES/NO/WTOR)
  Precheck    => YES         Precheck for flags and passes (YES/NO)
  Appl Parms  =>


Command ===>
   PF1=Help     PF2=End     PF3=Return                   PF6=Roll
                                                         PF12=Retrieve
```

Figure 25. Input Panel for INGREQ Command

The IMS-specific features concern the **Type** and the **Appl Parms** fields:

Type The possible types for a STOP request are NORM, IMMED, and FORCE.
For each of these, a shutdown command must be specified in the
SHUTDOWN policy item of the respective application (IMSIMSZ in the
example panel). This is the command that will be issued by INGREQ.

Appl Parms

You can specify the following parameters in this field:

Shutdown option

When an IMS subsystem is defined as a control region, the
shutdown commands require a so-called shutdown *option* as one of
their parameters. Shutdown options are associated with an
additional command (through the SHUTTYPES keyword, see
"SHUTTYPES—Issue Commands at Operator Shutdown" on page
72), and the command that is associated with the specified option
will be issued during the shutdown process. A default option must
be coded in the shutdown commands (see "Shutdown" on page
19). However, you can override that default. To do that you must
specify the option of your choice in the **Appl Parms** field
according to the following format

OPTION={DUMPQ|BACKUP|FREEZE|PURGE|DUMP|NODUMP}

When you do a NORM or IMMED shutdown, the only options
allowed are:

- For a DBCTL region: PURGE, FREEZE
- For a CTL region: PURGE, FREEZE or DUMPQ

When you do a FORCE the only options allowed are DUMP or
NODUMP.

For a description of the shutdown options see the IMS
documentation.

Broadcast

This parameter specifies whether or not the operators are notified that the subsystem is going to be closed. The format is

```
BROADCAST={YES|NO|CTL}
```

NO is the default.

Note: For stopping message regions, use the INGLIST command of SA z/OS.

Chapter 8. TCO Functions

The master terminal functions provide a full-screen panel interface to perform TCO functions. Select option 9, TCO Management, to display the **TCO Main Menu**:

```
 EVIKMT00      IMS Automation: TCO Main Menu                  Page:   1 of   1
                                                              Date: 08/22/05
 Resource/Domain  => IMS721C4                   (? for list) Time: 12:17
                                                             Domain:

 TCO Status . . . . . . . . :

            1  Load a specific member
            2  Enable TCO processing
            3  Disable TCO processing
            4  View the Control file definitions




 Command ===>
 F1=Help    F2=End     F3=Return   F4=IMS Menu            F6=Roll
```

Figure 26. TCO Main Menu

The Timer-Controlled Operations (TCO) interface lets you issue TCO commands from the IMS Automation interface.

From this TCO Main Menu, you can perform four functions:

1. Load a specific member
2. Enable TCO processing
3. Disable TCO processing
4. View the control file definitions

TCO Main Menu Option 1 — Load a Specific Member

Select Option 1 from the TCO Main Menu to load a specific member. Panel EVIKMT10 is displayed. Enter a '?' to see a member list:

```
┌─────────────────────────────────────────────────────────────────────────┐
│  EVIKMT10      IMS Automation: TCO Member Load            Page: 1 of 1    │
│                                                          Date: 08/22/05   │
│  Resource/Domain  => IMS711C4/APL/KEY1        (? for list) Time: 09:28:30 │
│                                                          Domain: IPSNM    │
│                                                                           │
│  TCO Status . . . . . . . : Available                                     │
│                                                                           │
│  Member . . . . . . . . . . ?_____    (? for list)                       │
│                                                                           │
│  Alternate Destination  . . _____                                       │
│                                                                           │
│  Maximum Segment Size . . .  __                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│  Command ===>                                                             │
│  F1=Help    F2=End     F3=Return   F4=IMS Menu          F6=Roll           │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 27. TCO Member Load Panel

Select a member:

```
┌─────────────────────────────────────────────────────────────────────────┐
│  EVIKMT10      IMS Automation: TCO Member Load            Page: 1 of 1    │
│                                                          Date: 08/22/05   │
│  Resource/Domain  => IMS711C4/APL/KEY1        (? for list) Time: 09:29:00 │
│                                                          Domain: IPSNM    │
│                                                                           │
│  TCO Status . . . . . . . : Available                                     │
│        +----------------------------------------------------------------  │
│  Member |   Select one of the user supplied TCO members                   │
│         |   _ STRTLNES        START LINES                                  │
│  Alterna|   s ASGNTRAN        ASSIGN TRANSACTIONS                          │
│         |   _ DISPROG         DISPLAY ACTIVE PROGRAMS                      │
│  Maximum|                                                                  │
│         |                                                                  │
│         |                                                                  │
│         |                                                                  │
│         |                                                                  │
│         |                                                                  │
│         |                                                                  │
│         |  F1=Help    F3=Cancel                                           │
│        +----------------------------------------------------------------  │
│  Command ===>                                                             │
│  F1=Help    F2=End     F3=Return   F4=IMS Menu          F6=Roll           │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 28. TCO Member Load Panel

The member name is inserted. Press ENTER to load:

```
EVIKMT10       IMS Automation: TCO Member Load            Page: 1 of 1
                                                          Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:29:30
                                                          Domain: IPSNM


TCO Status . . . . . . . : Available

Member . . . . . . . . . ASGNTRAN    (? for list)

Alternate Destination  . .  _____

Maximum Segment Size . . .  __






Command ===>
F1=Help    F2=End      F3=Return   F4=IMS Menu          F6=Roll
```

Figure 29. TCO Member Load Panel

You will receive a message that the command is in progress:

```
EVIKMT10       IMS Automation: TCO Member Load            Page: 1 of 1
                                                          Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:30:00
                                                          Domain: IPSNM


TCO Status . . . . . . . : Available

Member . . . . . . . . . ASGNTRAN    (? for list)

Alternate Destination  . .  _____

Maximum Segment Size . . .  __





 COMMAND IN PROGRESS
Command ===>
F1=Help    F2=End      F3=Return   F4=IMS Menu          F6=Roll
```

Figure 30. TCO Member Load Panel

TCO Main Menu Option 2 — Enable TCO Processing

Select Option 2 from the TCO Main Menu to enable TCO processing:

```
  EVIKMT00        IMS Automation: TCO Main Menu                Page: 1 of 1
                                                               Date: 08/22/05
  Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:30:30
                                                               Domain: IPSNM


  TCO Status . . . . . . . . : Available

  Select an option . . . . . . 2 1  Load a specific member
                                  2  Enable TCO processing
                                  3  Disable TCO processing
                                  4  View the Control file definitions









  Command ===>
  F1=Help     F2=End      F3=Return   F4=IMS Menu              F6=Roll
```

Figure 31. TCO Main Menu

You will receive a message when the START command has completed:

```
  EVIKMT00        IMS Automation: TCO Main Menu                Page: 1 of 1
                                                               Date: 08/22/05
  Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:31:00
                                                               Domain: IPSNM


  TCO Status . . . . . . . . : Available

  Select an option . . . . . . _ 1  Load a specific member
                                  2  Enable TCO processing
                                  3  Disable TCO processing
                                  4  View the Control file definitions








  DFS058I 10:00:44 START COMMAND COMPLETED    I31A
  Command ===>
  F1=Help     F2=End      F3=Return   F4=IMS Menu              F6=Roll
```

Figure 32. TCO Main Menu - Enable TCO Processing

TCO Main Menu Option 3 — Disable TCO Processing

Select Option 3 from the TCO Main Menu to disable TCO processing:

```
 EVIKMT00        IMS Automation: TCO Main Menu              Page: 1 of 1
                                                            Date: 08/22/05
 Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:32:00
                                                            Domain: IPSNM


 TCO Status . . . . . . . . : Available

 Select an option . . . . . . 3 1  Load a specific member
                                 2  Enable TCO processing
                                 3  Disable TCO processing
                                 4  View the Control file definitions









 Command ===>
 F1=Help    F2=End      F3=Return   F4=IMS Menu             F6=Roll
```

Figure 33. TCO Main Menu

You will receive a message when the PSTOP command has completed:

```
 EVIKMT00        IMS Automation: TCO Main Menu              Page: 1 of 1
                                                            Date: 08/22/05
 Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:32:30
                                                            Domain: IPSNM


 TCO Status . . . . . . . . : Available

 Select an option . . . . . . _ 1  Load a specific member
                                 2  Enable TCO processing
                                 3  Disable TCO processing
                                 4  View the Control file definitions








 DFS058I 10:02:05 PSTOP COMMAND COMPLETED   I31A
 Command ===>
 F1=Help    F2=End      F3=Return   F4=IMS Menu             F6=Roll
```

Figure 34. TCO Main Menu - Disable TCO processing

TCO Main Menu Option 4 — View TCO related Message IDs

Select Option 4 from the TCO Main Menu to view the definitions of the TCO and
TCOMEMBERS reserved message IDs (see "TCO—Issue Commands for
Time-Driven Procedures" on page 80 and "TCOMEMBERS—Define TCO
Members" on page 81):

```
EVIKMT00        IMS Automation: TCO Main Menu                  Page: 1 of 1
                                                               Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:33:00
                                                             Domain: IPSNM


TCO Status . . . . . . . . : Available

Select an option . . . . . 4 1  Load a specific member
                             2  Enable TCO processing
                             3  Disable TCO processing
                             4  View the Control file definitions










Command ===>
F1=Help    F2=End     F3=Return   F4=IMS Menu              F6=Roll
```

Figure 35. TCO Main Menu

The following panel will be displayed. Select Option 1 to view the TCO command entries:

```
EVIKMT40      IMS Automation: TCO Control File Display Menu   Page: 1 of 1
                                                               Date: 08/22/05
Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:33:30
                                                             Domain: IPSNM


TCO Status . . . . . . . . : Available

Select an option . . . . .  1 1  View the TCO command entries
                              2  View the TCO load members










Command ===>
F1=Help    F2=End     F3=Return   F4=IMS Menu              F6=Roll
```

Figure 36. TCO Control File Display Menu

The following panel will be displayed:

```
AOFK3D0X              SA z/OS - Command Response        Line  1    of 7
Domain ID   = IPSNM  ---------- DISPACF  ----------        Date = 08/22/05
Operator ID = ABCD                                         Time = 04:51:24

Command = ACF ENTRY=IMS711C4,TYPE=TCO,REQ=DISP
SYSTEM = KEY1     AUTOMATION CONFIGURATION DISPLAY - ENTRY= IMS711C4
------------------------------------------------------------
AUTOMATION CONFIGURATION DISPLAY - ENTRY= IMS711C4
 TYPE IS TCO
 REPLY           = (INIT,,'DFSTCF LOAD DFSTCF  .')
 REPLY           = (SPEC,,'DFSTCF LOAD &EHKVAR1 .')
 REPLY           = (START,,'/START LTERM DFSTCFI .')
 REPLY           = (STOP,,'/PSTOP LTERM DFSTCFI .')
END OF MULTI-LINE MESSAGE GROUP




 Action ===>
         PF1= Help            PF3= Return            PF5= Refresh
         PF6= Roll
```

Figure 37. TCO Configuration Display Panel

Select Option 2 from the TCO Control File Display Menu to view the TCO load
members:

```
 EVIKMT40     IMS Automation: TCO Control File Display Menu    Page: 1 of 1
                                                               Date: 08/22/05
 Resource/Domain  => IMS711C4/APL/KEY1          (? for list) Time: 09:35:00
                                                               Domain: IPSNM
 TCO Status . . . . . . . . : Available

 Select an option . . . . .  2 1  View the TCO command entries
                               2  View the TCO load members








 Command ===>
 F1=Help    F2=End     F3=Return   F4=IMS Menu            F6=Roll
```

Figure 38. TCO Control File Display Menu

The following panel will be displayed:

```
AOFK3D0X               SA z/OS - Command Response    Line  1    of 6
Domain ID   = IPSNM     --------- DISPACF ----------   Date = 08/22/05
Operator ID = SCOT                                     Time = 06:43:41

Command = ACF ENTRY=IMS711C4,TYPE=TCOMEMBERS,REQ=DISP
SYSTEM = KEY1     AUTOMATION CONFIGURATION DISPLAY - ENTRY= IMS631C4
--------------------------------------------------------------------------------
AUTOMATION CONFIGURATION DISPLAY - ENTRY= IMS7311C4
 TYPE IS TCOMEMBERS
 NAME           = (STRTLNES,'START LINES')
 NAME           = (ASGNTRAN,'ASSIGN TRANSACTIONS')
 NAME           = (DISPROG,'DISPLAY ACTIVE PROGRAMS')
END OF MULTI-LINE MESSAGE GROUP




Command ===>
    PF1=Help     PF2=End      PF3=Return              PF6=Roll
                              PF9=Refresh             PF12=Retrieve
```

Figure 39. TCO Configuration Display Panel

Chapter 9. Displaying Critical Messages

Through the Critical Message Manager, IMS Automation utilizes the SA z/OS Status Display Facility (SDF). The Critical Message Manager displays critical messages in a prioritized, scrollable format. Messages are defined as critical in the AT.

Select option 7 from the main menu to display Figure 40.

```
KEY1I     IMS MONITOR PANEL



          MSC Links

          OLDS

          Recons



          Transactions

          CF Structures




                                                        08/22/05 10:38
 ===>
PF1=HELP 2=DETAIL 3=END 6=ROLL 7=UP 8=DN                   12=TOP
```

Figure 40. Critical Messages Manager Panel. If critical messages have accumulated for a category, the category will be highlighted.

SDF's IMS Monitor Panel, shown in Figure 40, lists categories of critical messages. If the CMM has accumulated any critical messages for a category, that category will be highlighted, according to severity of message.

In addition to SDF, many IMS messages are captured via Captured Message support. These can be displayed from the DISPINFO command for the subsystem.

To View Critical Messages

1. Tab to the category you wish to view.
2. Press PF2 to display the detailed list.

Figure 41 shows a sample critical message display.

```
             ---- DETAIL STATUS DISPLAY ----
                                             1 OF    6


     COMPONENT: DXR008E              SYSTEM   : SY1

     COLOR   : YELLOW               PRIORITY :     501

     DATE    : 08/22/05             TIME     : 17:07:30

     REPORTER : AUTO1               NODE     : CNM01

     REFERENCE VALUE: IMS10AA-DXR0108E

      JOB IMS10AA - DXR008E IRLM INITIALIZATION ABEND




  ===>
 1=HELP   3=RETURN      6=ROLL 7=UP 8=DOWN 9=ASSIST 10=DELETE 11=BOTTOM 12=TOP
```

Figure 41. Detail Display of Critical Message

Chapter 10. Broadcasting Messages, Issuing Commands, and Listing Information for an IMS Resource

With the INGIMS command dialog you can issue any IMS operator commands, broadcast messages to all or selected IMS users, and display information about IMS resources.

For a detailed description of the INGIMS command, refer to *IBM Tivoli System Automation for z/OS Operator's Commands*.

```
 EVIKYCMD               SA z/OS - Command Dialogs     Line
 Domain ID   = IPSFM    ---------- INGIMS  ----------   Date = 08/22/05
 Operator ID = ASTA                                     Time = 16:41:03

 Resource          => IMS721C4/APL/KEY2               Format: name/type/system
 System            =>                      System name, domain ID or sysplex name
 Request           => BROADCAST            CMD, BROADCAST or INFO
 IMS Command       => BROADCAST
 IMS Route         => ACTIVE
 IMS Message       =>
                   =>




 Command ===>
    PF1=Help     PF2=End       PF3=Return   PF4=DISPINFO       PF6=Roll
                               PF9=Refresh                     PF12=Retrieve
```

Figure 42. INGIMS Command Dialog

You can specify the following:

Resource
> Specifies the name of an IMS resource. The format is name/type/system or name/type for sysplex resources. Wildcard characters are supported.

System
> Is the name of the system (system name, domain id, or syplex name) to which the command is issued. This is only necessary when the resource is not part of the local sysplex.

Request
> Specifies the request to be issued to the IMS subsystem. It can be one of the following: CMD, BROADCAST or INFO.

IMS Command
> Specifies the IMS transaction and its parameters to be executed. The IMS command field is automatically filled with the text above. You can make changes to it before pressing Enter to execute the transaction.

IMS Route
> Specifies the routing information. The routing information format is the same as specified for the /BRO command.

IMS Message
> Specifies the message to be sent to all or selected IMS users or terminals.For example, you can notify users of a planned shutdown.

With PF4 DISPINFO, you can display detailed information about the specified subsystem.

Chapter 11. The Status Display Facility

The Status Display Facility uses color to represent the various subsystem resource statuses such as error, warning, action, or informational states. Typically, a subsystem shown in green on a Status Display Facility status panel indicates that it is up, whereas red indicates a stopped or problem state.

The Status Display Facility status display panels can be tailored to present the status of system components in a hierarchical manner. The hierarchical display of status information is implemented using tree structures. A tree structure always starts with the system name as the root component. The "leaves" of the tree are the monitored resources.

Color can be propagated up or down the leaves of the tree structure based on the order of dependencies. The effect of propagation is to consolidate, at the root component, the status of all the monitored resources in that system. In this way, the color of the root component reflects the most important or critical status in a computer operations center. If all the monitored resources are green, the root component (the system) will be green.

IMS Automation provides additional Status Display Facility panels that monitor events that occur in the following areas for all IMS regions defined to IMS Automation:

MSC Links
> Shows the Status of MSC Links

OLDS Shows the error status of OLDS datasets.

Recons
> Shows the error status of RECONS datasets.

Transactions
> Shows any transactions that have encountered an error.

CF Structures
> Shows coupling facility structures used by IMS that have errors.

To use the IMS Automation Status Display Facility panels, enter SDF on a NetView panel command line. A panel similar to the following is displayed:

```
SYSTEM     SA z/OS - SUPPORT SYSTEMS

 System  Subsystems  WTORs     Gateways   Products  System

 KEY1    IM631C4     NETBTST1  IPSFN0     C I D O   S C M B T U

 KEY2                                     C I D O   S C M B T U

 KEY3                                     C I D O   S C M B T U

 KEY4                                     C I D O   S C M B T U

 XXXX                                     C I D O   S C M B T U




                                                  08/22/05 10:45
 ===>
 1=HELP 2=DETAIL 3=RETURN   6=ROLL   8=NEXT SCR   10=LEFT 11=RIGHT 12=TOP
```

Figure 43. Status Display Facility Main Panel

Note: Sample Status Display Facility panels are provided with IMS Automation.
The system programmer customizes the panels for your specific
environment, so the panels shown here will not look exactly like your
panels.

This could be your primary panel that lists the systems and their status. The color
of KEY1 through KEY4 will reflect the most critical status of any resource in that
system.

If you place the cursor under the letter I on the panel displayed in Figure 43 and
press PF8, the following panel displays (assuming you are using the default
sample panels):

```
KEY1I    IMS MONITOR PANEL



        Archive

        MSC Links

        OLDS

        Recons



        Transactions

        CF Structures


                                                  08/22/05 10:38
 ===>
 PF1=HELP 2=DETAIL 3=END 6=ROLL 7=UP 8=DN                     12=TOP
```

Figure 44. IMS Monitor Panel

This shows several categories in which IMS status is important. If the letter I shown on the previous panel was red, then at least one of the items on the IMS Monitor panel will be red. Tab down to the red item and press PF8. This displays the messages logged against that item, as shown in the following panel:

```
KEY1IOL1  IMS OLDS

 System  Message text
 08/22/05  10:59:31  IMS712CX  " IMS712CX NEEDS ANOTHER OLDS DATASET - OLDS SHO




                                                             08/22/05 10:59
 ===>
PF1=HELP 2=DETAIL 3=RET          6=ROLL 7=UP                 11=RT 12=TOP
```

Figure 45. IMS Monitor Panel

Note: If the full message is not displayed on the screen, press PF11 to shift to the right.

To see the detail of a message, tab down to that message and press PF2. This displays a panel similar to the following:

```
             ---- DETAIL STATUS DISPLAY ----
                                                    1 OF    1


        COMPONENT: IMS712CX               SYSTEM   : KEY1

        COLOR    : PINK                   PRIORITY :     601

        DATE    : 08/22/05               TIME     : 10:59:31

        REPORTER : KAT                    NODE     : IPSFM

        REFERENCE VALUE: IMS712CX_OL_DFS3260

          " IMS712CX NEEDS ANOTHER OLDS DATASET - OLDS SHORTAGE"




 ===>
1=HELP  3=RETURN 4=DELETE  6=ROLL 7=UP 8=DOWN 9=ASSIST 11=BOTTOM 12=TOP
```

Figure 46. Detail Status Display

To delete a message, press PF4 on this screen.

Note: If any of the panels have 1 of X in the upper-right corner of the screen, where X is a number greater than 1, subsequent panels contain additional data.

Press PF8 to scroll forward to view the information. Press PF7 to scroll back.

Chapter 12. NMC Display Support

The following messages and events will be displayed on NMC against the subsystem where they occur.

The alerts will be attached to the subsystem as a minor resource and will have the following resource names:

Messages	plexname.resname/APL/sysname.MSG/message_id
MSC Links	plexname.resname/APL/sysname.MSC/linkname
OLDS	plexname.resname/APL/sysname.OLDS/DFS3258 plexname.resname/APL/sysname.OLDS/DFS3260 plexname.resname/APL/sysname.OLDS/SWITCHING plexname.resname/APL/sysname.OLDS/ARCHIVE/ddname plexname.resname/APL/sysname.OLDS/ERROR/ddname plexname.resname/APL/sysname.OLDS/SPARES plexname.resname/APL/sysname.OLDS/MINIMUM
Recons	plexname.resname/APL/sysname.RECONS/ddname plexname.resname/APL/sysname.RECONS/SPARE plexname.resname/APL/sysname.RECONS/DUAL
Transactions	plexname.resname/APL/sysname.TRANS/tranname
CQS	plexname.resname/APL/sysname.CQS/structure

Glossary of IMS Automation Terms

This glossary defines special IMS terms used in the library and words used with other than their everyday meaning. In some cases, a definition may not be the only one applicable to a term, but it gives the particular sense in which it is used in the IMS Automation Option library.

abend. Abnormal end of task.

ACB. Access Method Control Block (VTAM and VSAM).

access method. A technique for moving data between main storage and input/output devices.

ANSI. American National Standards Institute.

AOST. Automated Operator Station Task.

APAR. Authorized program analysis report.

application program. A program written for or by a user that applies to the user's work. In data communication, a program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities.

automation. Computer system control of operation processes.

authorized program analysis report (APAR). A request for correction of a problem caused by a defect in a current unaltered release of a program.

batch. An accumulation of data to be processed.

batch message processing. In IMS/VS, a batch processing program that accesses online data bases and message queues.

BMP. Batch Message Processing Region.

CCTL. Coordinator Controller.

central processing complex (CPC). A conglomeration of several processors and other devices in one or more physical units. This usually means several processors running under the control of a single MVS/ESA operating system. For example, a 3090 model 400 processor complex can run as a four-processor CPC, or it can be partitioned into the equivalent of two 3090 model 200s, each of which runs as a CPC with its own operating system.

CICS. Customer Information Control System.

CLIST. Command List.

CMM. Critical Message Manager.

CNM. Communications Network Management.

command. In IMS, an instruction similar in format to a high-level programming language statement.

command list (CLIST). A list of commands and statements designed to perform a specific function for the user. Command lists can be written in REXX or in NetView Command List Language.

common state handler (CSH). Routine that IMS Automation calls from the NetView Automation Table to drive the actions defined in state/action tables.

concurrent. Pertaining to the occurrence of two or more activities within a given interval of time.

CPC. Central Processing Complex.

critical message manager (CMM). Facility in IMS Automation which displays critical messages in a scrollable format and enables operators to access information relating to the critical messages displayed.

CSA. Common Storage Area.

CSH. Common State Handler.

database. A collection of data fundamental to a system.

database backout. The function of removing changes made to user data sets by in-flight transactions.

database recovery. The function of restoring the user data sets, starting with a backup copy and applying all changes made to each data set after the backup was taken.

data security. The protection of data against unauthorized disclosure, transfer, modifications, or destruction, whether accidental or intentional.

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

DBCTL. Data Base Control.

DEDB. Data Entry Data Base.

DLISAS. Data Language Interface Separate Address Space (IMS Batch).

domain. In IMS, a set of subsystems on a specific NetView domain defined by the system programmer in the control file.

end user. In IMS, anyone using IMS to do a job, usually by interacting with an application program (transaction) by means of a terminal.

exception. An abnormal condition such as an I/O error encountered in processing a data set or a file, or using any resource.

Fast Path. IMS Automation function which enables the user to access any IMS Automation interface panel by entering = and an identifying number.

Fast Path Message Region. In IMS, a region that executes programs that require good response characteristics and that have large transaction volumes. Message processing is grouped for load balancing and synchronized for database integrity and recovery.

focal point system. In IMS, a system in which multiple subsystems are interconnected. One subsystem serves as a focal point of control, and the others are referred to as intermediate or distributed systems.

HM. Help Message.

HSBID. Hot Standby Identifier.

HSSP. High-Speed Sequential Processing.

initial program load (IPL). The initialization procedure that causes an operating system to commence operation.

initialization. Actions performed by IMS to construct the environment in the IMS region to enable IMS applications to be run. A process started by SA z/OS and IMS Automation to construct the environment in which automation will occur.

installation. A particular computing system, in terms of the work it does and the people who manage it, operate it, apply it to problems, service it and use the work it produces. The task of making a program ready to do useful work. This task includes generating a program, initializing it, and applying PTFs to it.

Installation Verification Procedure (INSTALL/IVP). Procedure distributed with the system that tests the newly generated system to verify that the basic facilities are functioning correctly.

INSTALL/IVP. Install/Installation Verification Procedure.

Integrated Resource Lock Manager (IRLM). In IMS Automation, this facility is used as a lock manager, both as a single lock manager and in a data sharing environment.

intercommunication facilities. A generic term covering intersystem communication (ISC) and multiregion operation (MRO).

intersystem communication (ISC). Communication between separate systems by means of SNA networking facilities or by means of the application-to-application facilities of an SNA access method. ISC links IMS systems, and it may be used for user application-to-user application communication, or for transparently executing IMS functions on a remote IMS system.

IPL. Initial Program Load.

IRC. Interregion communication.

IRLM. Integrated Resource Lock Manager.

ISC. Intersystem Communication.

IVP. Installation Verification Procedure.

keyword. A symbol that identifies a parameter. A part of a command operand that consists of a specific character string.

local. In data communication, pertaining to devices that are attached to a CPC by cables, rather than data links.

local device. A device, such as a terminal, whose control unit is directly attached to a computer's data channel. No data link is used. Contrast with remote device.

lock manager. Feature of IMS Automation responsible for serializing the recovery process in areas where multiple subsystems can invoke recovery actions.

member. See partitioned data set.

MPP. Message Processing Program.

MSC. Multiple Systems Coupling.

MSDB. Main Storage Data Base.

MTO. Master Terminal Operator.

Multiple Systems Coupling (MSC). An IMS/VS feature that permits geographically dispersed IMS/VS systems to communicate with each other.

NCCF. Network Communications Control Facility.

network. An interconnected group of nodes. The assembly of equipment through which connections are made between data stations.

network configuration. In SNA, the group of links, nodes, machine features, devices, and programs that make up a data processing system, a network, or a communication system.

Network Communications Control Facility (NCCF). IBM licensed program consisting of a base for command processors that can monitor, control, and improve network operations.

non-XRF (non-XRF IMS). Represent IMS in a non-XRF configuration.

NPDA. Network Problem Determination Aid/Application.

OLDS. Online Log Data Set.

online. Pertaining to a user's ability to interact with a computer. Pertaining to a user's access to a computer via a terminal.

panel. In IMS Automation, the set of information displayed on a single screen of the user interface.

parameter. (ISO) A variable that is given a constant value for a specified application and that may denote the application.

partitioned data set (PDS). A data set in direct access storage that is divided into partitions, called members, each of which can contain a program, part of a program, or data. Synonymous with program library.

PDS. Partitioned Data Set.

PPI. Program-to-program interface.

preprocessor. Routine in IMS Automation that enables the programmer to define unique GLOBALV names to store the state value of certain processes.

processor (ISO). In a computer, a functional unit that interprets and executes instructions.

Program-to-program interface (PPI). A NetView component used by IMS Automation to enable users to send or receive data buffers from other programs. It also allows system and application programs to send alerts to the NetView hardware monitor.

PTF. Program Temporary Fix.

PUT. Program update tape.

RACF. Resource Access Control Facility.

RDS. Restart Data Set.

RECON. Recovery Control.

recovery routine. A routine entered when an error occurs during the performance of an associated operation. It isolates the error, assesses the extent of the error, and attempts to correct the error and resume operation.

remote. In data communication, pertaining to devices that are connected to a data processing system through a data link.

remote device. A device, such as a terminal, connected to a data processing system through a data link.

remote system. In IMS intercommunication, a system that the local IMS system accesses via intersystem communication or multiregion operation.

Resource Access Control Facility (RACF). A licensed program that provides for access control by identifying and verifying users to the system, authorizing access to DASD data sets, logging detected unauthorized access attempts, and logging detected accesses to protected data sets.

RMF. Resource Management Facility.

roll. In IMS Automation, the option to begin/rollover to another NetView session. This action is assigned to the PF6 key.

SDF. Status Display Facility. The display facility for SA z/OS.

security. Prevention of access to or use of data or programs without authorization.

service. The carrying out of effective problem determination, diagnosis, and repair on a data processing system or software product.

single-point-of-control. Feature of IMS Automation enabling the operator to monitor and control IMS subsystems from a single NetView console.

SLDS. System Log Data Set.

SMU. Security Maintenance Utility.

SNA. Systems Network Architecture.

software. (ISO) Programs, procedures, rules, and any associated documentation pertaining to the operation of a computer system. Contrast with hardware.

startup. The operation of starting up IMS by the system operator.

state/action table. In IMS Automation, state/action tables are a matrix of system events, states, and actions created by the system programmer. When an event occurs, the system references the state/action table and takes appropriate action.

status code. In IMS/VS, a two-character code in the program communication block (PCB) mask that indicates the results of a DL/1 call.

system. In IMS, an assembly of hardware and software capable of providing the facilities of IMS for a particular installation.

system initialization table. A table containing user-specified data that will control a system initialization process.

systems network architecture (SNA). The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through and controlling the configuration and operation of networks.

task. (ISO) A basic unit of work to be accomplished by a computer. Under IMS, the execution of a transaction for a particular user.

TCO. Timer-Controlled Operations.

terminal. A point in a system or communication network at which data can either enter or leave. In IMS, a device, often equipped with a keyboard and some kind of display, capable of sending and receiving information over a communication channel.

terminal operator. The user of a terminal.

transaction. A transaction may be regarded as a unit of processing (consisting of one or more application programs) initiated by a single request, often from a terminal. A transaction may require the initiation of one or more tasks for its execution.

update. To modify a file with current information.

VSCR. Virtual Storage Constraint Relief.

VTAM. Virtual Telecommunications Access Method. VTAM is one of the ways IMS communicates with terminals.

WTOR. Write To Operator with Reply.

XRF. Extended recovery facility, a software function that minimizes the effects of various failures on the end users.

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