C33
CICS TS and the MVS Logger - Overcoming Common Problems

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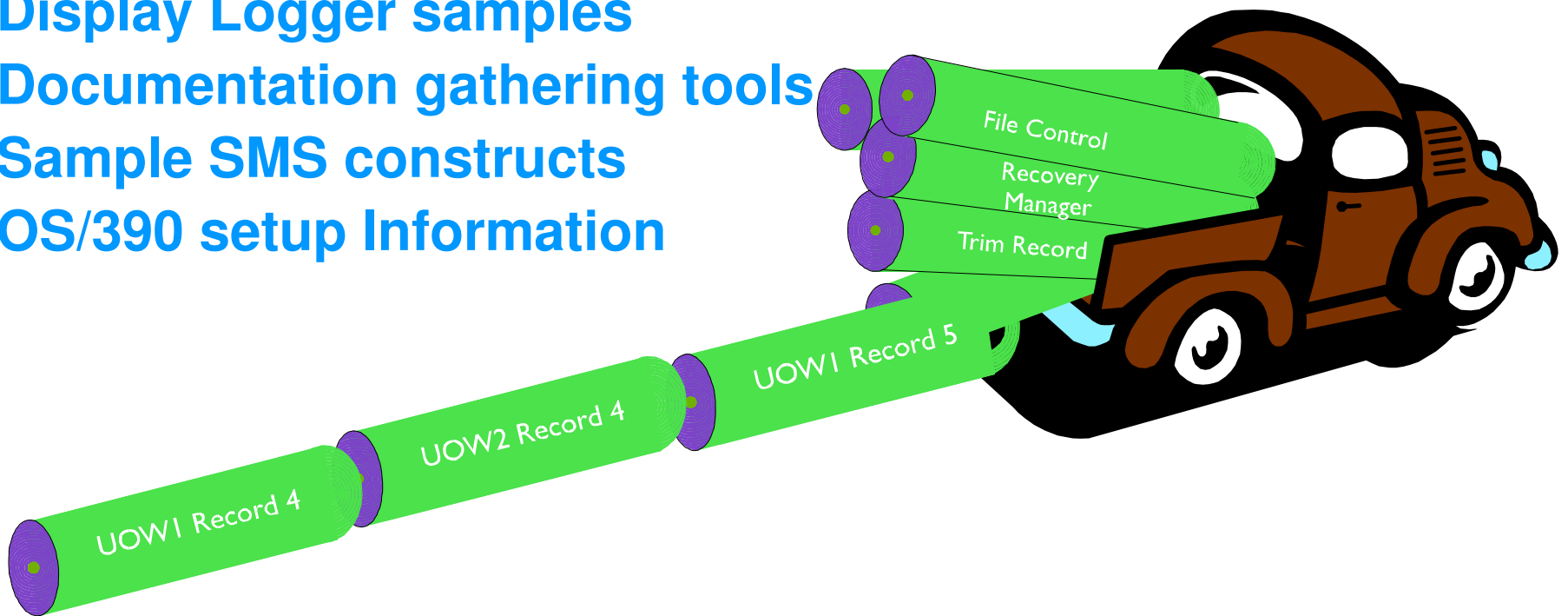
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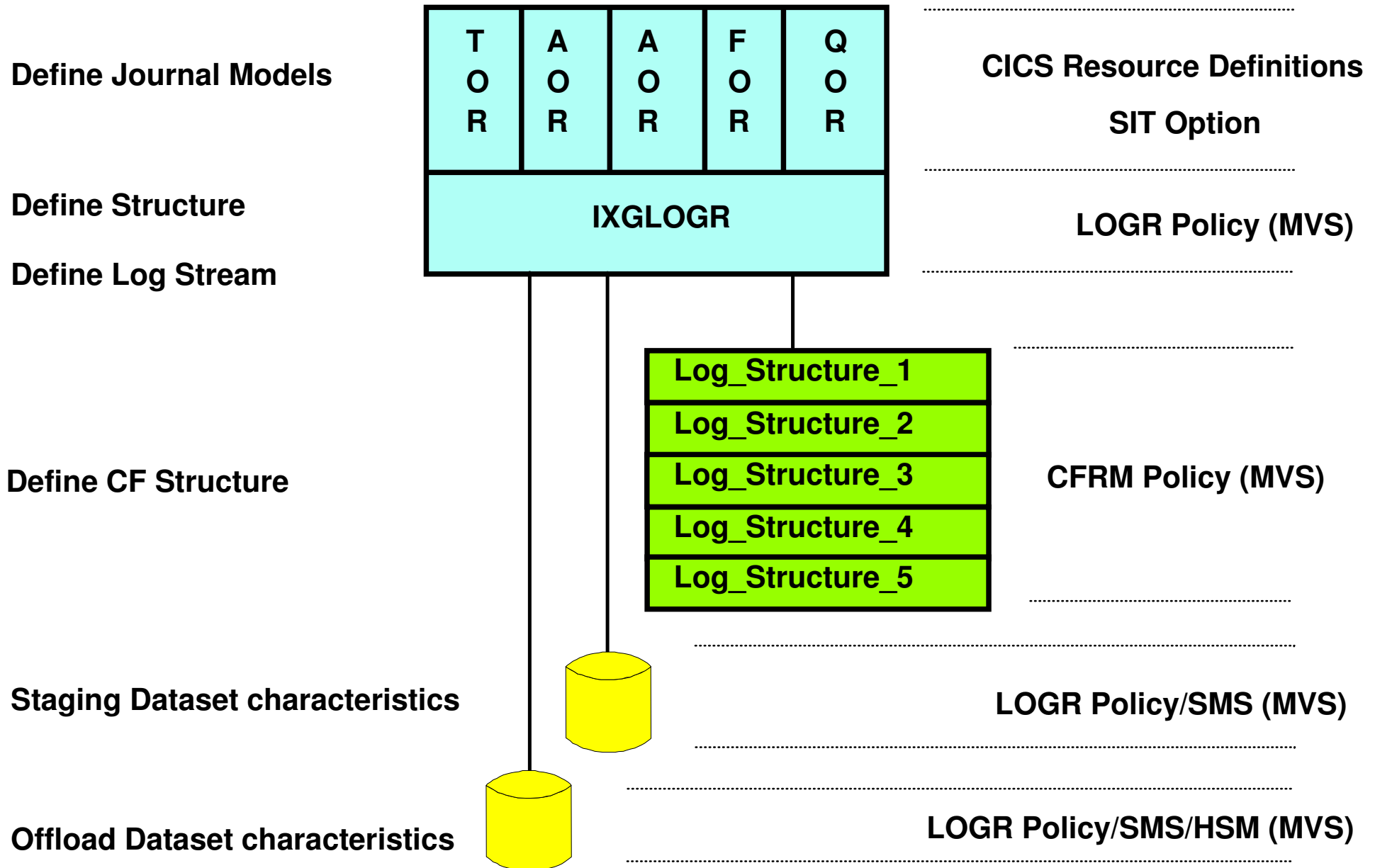**Las Vegas, NV**   **Feb. 10 - Feb. 14, 2003**

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Agenda

- **Making the pieces fit**
- **Dataset names**
- **User journals**
- **Appendix**
  - **Problems to avoid**
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  - **Sample SMS constructs**
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File Control

Recovery Manager

Trim Record

UOW1 Record 5

UOW2 Record 4

UOW1 Record 4

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Pieces and Parts

Define Journal Models

T O R	A O R	A O R	F O R	Q O R

CICS Resource Definitions

SIT Option

Define Structure

IXGLOGR

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Define Log Stream

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Define CF Structure

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Staging Dataset characteristics

LOGR Policy/SMS (MVS)

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LOGR Policy/SMS/HSM (MVS)

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Models to Models

- **MVS Log stream definitions**
  - define each log stream explicitly to the logger
  - define a number of log stream model definitions
  - use XLGSTRM global user exit to modify the default log stream specification
    - refer to the CICS Customization Guide
- **Default MVS log stream model definitions required for CICS logs**
  - &SYSNAME..DFHLOG.MODEL
  - &SYSNAME..DFHSHUNT.MODEL
    - &SYSNAME specified in IEASYSxx Parmlib member

- **CICS JOURNALMODEL**
  - auto-installed on first use
  - maps CICS system logs or journals to MVS log streams
  - cannot be used for VSAM RLS forward recovery logs
    - the fully-qualified log stream name is obtained from the VSAM catalog
- **Journal names table**
  - replaces the JCT
  - CICS creates dynamically
  - Contains
    - CICS log to log stream name
    - for user journals -log stream token returned by MVS at connect time

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CICS Journal Model Definition

```
//DFHCSDUP JOB CLASS=A,MSGCLASS=A
//UPGRCSD   EXEC  PGM=DFHCSDUP
//STEPLIB   DD DSN=CICSTS12.CICS.SDFHLOAD,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
```

DEFINE JOURNALMODEL(CICSLOG)   The name of the model is CICSLOG
    GROUP(TEST)   The CICS group name is TEST
    DESCRIPTION('DFHLOG LOGSTREAM USING A TEMPLATE DEFINITION')
    JOURNALNAME(DFHLOG)
    TYPE(MVS)   Records to be written to the MVS log stream
                                                specified.

    STREAMNAME(&USERID..&APPLID..DFHLOG) The CICS logger issues an IXGCONN to
                                                connect to the streamname derived from the
                                                template or the name explicitly specified.

DEFINE JOURNALMODEL(SYSSHUNT)
    TYPE(MVS) GROUP(TEST) JOURNALNAME(DFHSHUNT)
    DESCRIPTION('DFHSHUNT LOGSTREAM EXPLICIT DEFINITION')
    STREAMNAME(TCOM.IYCLZCCA.DFHSHUNT)

** NOTE ** If JOURNALMODELs are not defined, CICS will attempt to connect to a log stream named
    &USERID..&APPLID..DFHLOG .   If the log stream has not been defined to the logger, an error
    is returned. CICS then issues an IXGINVNT DEFINE for the log stream using characteristics from the MVS
    model *&SYSNAME..DFHLOG.MODEL* (which must be defined in the LOGR policy).

Journal Model notes

CICS journal models are defined using either DFHCSDUP in batch, or CEDA, online.

JOURNALMODEL defines the name associated with this definition.
GROUP is a standard Resource Definition group name.
DESCRIPTION   - words that describe the resource.
JOURNALNAME - for the system logs, DFHLOG and DFHSHUNT
                    - for user journals a meaningful name should be chosen (i.e. DFHJ15)
TYPE ----- MVS   - records are to be written to the MVS log stream specified in STREAMNAME.
        ------SMF   - records are to be written in SMF format to the MVS SMF log.
                    NOTE--- SMF may not be used with CICS SYSTEM logs (DFHLOG and DFHSHUNT)
STREAMNAME   - contains either an explicit log stream name or a template used to build a log stream name.
                    - in either case, the name, which must be defined in the LOGR policy before a connection will complete
                      the logstream name, may be defined using the IXCMIAPU utility or by CICS issuing an IXGINVNT DEFINE
                      during an initial start.
                    - for a Coupling Facility logstream, it must be associated with a valid structure which is
                      defined in the LOGR policy and in the CFRM policy. Definitions are made using the IXCMIAPU utility.

Journal Model notes ....

During a CICS INITIAL start, the CICS logger component will search the CICS JOURNALMODELs for the DFHLOG and DFHSHUNT entries. The STREAMNAME parm in the JOURNALMODEL provides a connection to the MVS log stream name (LSN).

The JOURNALMODEL may contain an explicit LSN (i.e. JIMG.JIMSAOR.DFHLOG) or a TEMPLATE value (i.e. &applid..DFHLOG), in which case the symbolic qualifiers are used to build the actual log stream name.
  Valid symbolic qualifiers are:
    &USERID The symbolic name for the CICS region userid, which can be up to eight characters.
               If the region does not have a userid, the string 'CICS' will be used.
    &APPLID   The symbolic name for the CICS region APPLID as specified on the system initialization parameter,
               which can be up to eight characters.
    &JNAM   The symbolic name for a journal name that references, either by a specific or generic match,
               this journal model definition. &JNAME can be up to eight characters in length.
    &SYSID   The symbolic name for the CICS region SYSID as specified on the SYSIDNT system
               initialization parameter. If SYSID is not specified, the string 'CICS' will be used.

If JOURNALMODELs have not been defined, *&USERID..&APPLID..DFHLOG (or DFHSHUNT)* will be
used as the LSN. In the case where CICS has been started as a system started task, the name will be
STC..&APPLID..DFHLOG.

Once the log stream name is defined, CICS will issue an IXGCONN to connect to the logstream. If the log stream has not been defined in MVS, i.e. the log stream is not found in the LOGR policy, the MVS logger will return IXGRSNCODENOSTREAM (RC 8 reason code 080B). Upon receiving an 080B, CICS will attempt to create the log stream via an IXGINVNT request DEFINE. The logstream name will be the same as that used for the failed connection request, but using the MVS model *sysname.DFHLOG.MODEL*.

For a non-system log, the MVS model name used will consist of the first two qualifiers of the logstream name with MODEL appended (i.e. if the LSN is JIM.JON.HARRY - the model name will be JIM.JON.MODEL).   The MVS models must exist in the LOGR policy (i.e. a DEFINE LOGSTREAM has been issued using IXCMIAPU).

If the create request fails, CICS will abend, with a message in the range of DFHLG0503 through 0511 being issued.

In cases of failure, be sure to have an IXCMIAPU listing of the LOGR and CFRM policies and the message logs available prior to contacting IBM service.

Define a CF Logstream

```
//DEFSTR JOB CLASS=A,MSGCLASS=A
//POLICY EXEC PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
 DATA TYPE(LOGR) REPORT(YES)
```

DEFINE LOGSTREAM NAME(IYOT1.DFHLOG)   Matches name in CICS Journal Model

AUTODELETE(NO) *   Always NO for DFHLOG and DFHSHUNT

DIAG(YES)   If an 804 (IXGRSNCODENOBLOCK) reason code will be given,
a dump of the logger is taken before returning to CICS

EHLQ(NO_EHLQ)   Allows specification of 33 characters for a high level
qualifier - mutually exclusive with HLQ (added by OW49608)

HIGHOFFLOAD(80) *   Threshold, expressed as a % of logstream
space, when offloading is to take place

HLQ(GRAUEL)   High level qualifier - offload dataset name

LOGGERDUPLEX(COND) *   The logstream may participate in CF Duplexing.

LOWOFFLOAD(40) *   Value, expressed as a % of the space used
by the logstream, for the offload target

LS_DATACLAS(LS10MEG) *   SMS data class used for DASD offload

LS_SIZE(500) *   The number of 4K control intervals to be allocated for each offload
dataset

MODEL(NO)

OFFLOADRECALL(NO) *   Always set to NO for CICS logstreams (added by OW48404)

RETPD(0) *   Retention period, zero for DFHLOG and DFHSHUNT

STG_DUPLEX(YES) DUPLEXMODE=(COND) *   Log writes are to be duplexed to the Staging Dataset if the CF
becomes volatile or failure dependent (CF and MVS in same CEC)

STG_SIZE(9000) *   No. of 4K control intervals in Staging dataset

STRUCTNAME(LOG_JG) *   Structure that will contain the data

* parms which affect performance

Define CF Logstream Notes

Many parameters affect logstream performance, some more than others.

AUTODELETE and RETPD can have a disastrous effect on the DFHLOG and DFHSHUNT if specified other than AUTODELETE(NO) and RETPD(0). With AUTODELETE(YES) and RETPD>0, even though CICS will attempt log tail management, all data will be offloaded to the offload datasets and held for the number of days specified for RETPD. AUTODELETE(YES) lets the logger (rather than CICS) decide when to delete the data. When a new offload dataset is allocated and AUTODELETE(YES) is specified, the logger will delete the data on the old offload dataset. If CICS needs the data for backout, the result will be an 804 return code and CICS will terminate with a DFHLG0772.

DIAG(YES) should always be specified. In a case where the logger is unable to locate data requested by CICS, a return code 8 with reason code IXGRSNCODENOBLOCK is presented to CICS. This means backout data is not available and CICS treats it as a fatal error, terminating the region with a DFHLG0772.   In many cases, information from the logger address space is needed to resolve the problem. When DIAG(YES) is specified in the logstream definition, a dump of the logger address space is provided (by the logger) in addition to the DFHLG0772 dump provided by CICS.   There is no overhead associated with this parm unless a dump is requested.

The HIGHOFFLOAD parameter, in conjunction with the size of the logstream, has a major effect on the amount of virtual storage used by the Logger. Before data is written to the Coupling Facility (CF), it is written to a buffer in the logger dataspace. If staging datasets are used, the data is written to the staging dataset rather than the dataspace.

If the HIGHOFFLOAD value is too high, there may not be enough room in the logstream to accept data written to the logstream during offload processing. This can lead to an entry or structure full condition -- which causes log writes to be suspended for 3 seconds.

HIGHOFFLOAD should be set at 80 - 85% for DFHLOG, DFHSHUNT and user journals.
LOWOFFLOAD should be set between 40 and 60% for DFHLOG and DFHSHUNT, 0 for user journals.

If the extent size of the LS_DATACLAS (or the value specified in LS_SIZE) is too small, frequent DASD shifts (allocation of a new offload dataset) will occur. Frequent DASD shifts have a negative effect on performance and expose the system to a depletion of the offload datasets. The number of offload datasets is limited by the DSEXTENT value specified in the LOGR couple dataset. The DSEXTENT value defines the number of logger directory entries. Each directory can point to a maximum of 168 offload datasets.   Prior to OS/390 R1.3 the number of extents was limited to 1; with R1.3 and above, the number is limited only by the amount of DASD available.

LOGGERDUPLEX(COND) indicates the logstream may participate in coupling facility duplexing.   Refer to 'Setting Up a Sysplex' for detailed information.

LS_SIZE defines the allocation size for the offload datasets.   It should be specified large enough to contain several offloads, possibly a day's worth. DFHLOG and DFHSHUNT should only offload a minimal amount of data; however, all data is offloaded for user journals.
For user journals it is very important to specify LS_SIZE large enough to limit the number of times an additional dataset is allocated, there can be large delays during the allocation process.

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Define CF Logstream Notes ...

STG_SIZE and logstream structure size (specified in the structure definition) are specified based on the amount of data to be contained in the logstream. The rule of thumb is it must be large enough to hold the data written during an activity keypoint interval plus the length of time of the longest running unit of work.

DFHLSCU should be run against the R410 system log and the output used as a STARTING POINT for STG_SIZE and the size used for the Coupling Facility structure definition .

Note - if LS_SIZE is not specified in the logstream definition and an extent size is not specified in the LS_DATACLAS, the value is taken from the ALLOCxx parmlib member or set via an ACS (Automatic Class Selection) routine. The default value in ALLOCxx is 2 tracks. Refer to the *MVS Initialization and Tuning Guide*.

This also applies to the staging dataset size (STG_SIZE). When staging datasets are used with a coupling facility logstream, STG_SIZE must be specified large enough to hold at least as much data as the CF logstream. Otherwise, the offloads will be triggered by the HIGHOFFLOAD percentage of the staging dataset rather than the CF logstream.

Data is written to the staging dataset in 4096 byte increments, regardless of the buffer size.

STG_DUPLEX(YES) with DUPLEXMODE=(COND) means, should the CF become volatile or exist in a failure dependent configuration, the data will be duplexed to the staging dataset, otherwise it is duplexed to buffers in the logger dataspace. A failure dependent configuration is when the Coupling Facility LPAR and the LPAR running OS/390 reside in the same CEC. Duplexing to the staging dataset means the cost of an I/O will be incurred for each write.

The structure used for the logstream will affect performance. Key factors include the number and characteristics of the logstreams which will share the structure. It is best to limit the number (LOGSNUM specified on the structure definition) to 10. Logstreams in a structure should have like characteristics. For example, TORs, AORs, and FORs typically have different logstream record size and volumes.

It is also important to remember logstream staging and offload (log) datasets are single extent VSAM linear datasets, the shareoptions MUST be specified '3,3'. If the shareoptions are anything other than '3,3' there is a risk the logger will be unable to read offloaded data and post CICS with return code 8, reason code 804 (*IxgRsnCodeNoBlock*). This will cause CICS to abend with a DFHLG0772.

When the offload process is triggered, the offload may be performed by the logger address space on a different MVS image. If the offload requires the movement of data to the log (offload) datasets, and the current dataset fills, a new dataset will be allocated. Unless the shareoptions are specified 3,3 the logger address space on the MVS image where CICS is running may not be able to access the dataset.

OFFLOADRECALL should be set to NO for CICS logstreams. This option was added via OW48404. Specifying NO indicates to the logger that if a required log dataset has been migrated via HSM, a new offload dataset is to be allocated. This prevents the logger from waiting for the recall and thus CICS is not put in a position where it is unable to write to a logstream.

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Define Logstream - DASDONLY

```
//DEFSTR JOB CLASS=A,MSGCLASS=A
//POLICY EXEC PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
```

DATA TYPE(LOGR) REPORT(YES)

DEFINE LOGSTREAM NAME(IYOT2.DFHLOG)	Matches name defined in Journal Model
AUTODELETE(NO) *	Always NO for DFHLOG and DFHSHUNT
DASDONLY(YES)	C. F. structures will not be used
DIAG(YES)	If an 804 (IXGRSNCODENOBLOCK) reason code will be given, a dump of the logger is taken before returning to CICS
EHLQ(NO_EHLQ)	Allows specification of 33 characters for a high level qualifier - mutually exclusive with HLQ (added by OW49608)
HIGHOFFLOAD(80) *	Threshold, expressed as a % of logstream space, when offloading is to take place
HLQ(GRAUEL)	High level qualifier - offload dataset name
LOWOFFLOAD(40) *	Value, expressed as a % of the space used by the logstream, of the offload target
LS_DATACLAS(LS10MEG) *	SMS dataclass used for DASD offload
LS_SIZE(4500) *	The number of 4K control intervals to be allocated for each offload dataset
MAXBUFSIZE(65532) *	Max buffer size of blocks written to the log
MODEL(NO)	
OFFLOADRECALL(NO) *	Always set to NO for CICS logstreams (added by OW48404)
RETPD(0) *	Retention period, zero for DFHLOG and DFHSHUNT
STG_SIZE(9000) *	The number of 4K control intervals in the Staging dataset

* parms which affect performance

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Define DASDONLY Logstream Notes

As with CF logstreams, many of the parameters affect logstream performance.

AUTODELETE and RETPD can have a disastrous effect on the DFHLOG and DFHSHUNT if specified other than AUTODELETE(NO) and RETPD(0). With AUTODELETE(YES) and RETPD>0, even though CICS will attempt log tail management, all data will be offloaded to the offload datasets and held for the number of days specified for RETPD. AUTODELETE(YES) lets the logger (rather than CICS) decide when to delete the data. When a new offload dataset is allocated and AUTODELETE(YES) is specified, the logger will delete the data on the old offload dataset. If CICS needs the data for backout, the result will be an 804 return code and CICS will terminate with a DFHLG0772.

DIAG(YES) should always be specified. In a case where the logger is unable to locate data requested by CICS, a return code 8 with reason code IXGRSNCODENOBLOCK is presented to CICS. This means backout data is not available and CICS treats it as a fatal error, terminating the region with a DFHLG0772. In many cases, information from the logger address space is needed to resolve the problem. When DIAG(YES) is specified in the logstream definition, a dump of the logger address is provided (by the logger) in addition to the DFHLG0772 dump provided by CICS. There is no overhead associated with this parm unless a dump is requested. This error is normally seen when CICS issues an IXGBRWSE for backout data or during activity keypoint processing when CICS issues the IXGDELET command to trim the tail of the log. It can also be returned during region startup when an IXGCONN (connect) is issued to connect to the logstream.

The HIGHOFFLOAD parameter, in conjunction with the size of the logstream, has a major effect on the amount of storage used by the Logger. Before data is written to the logstream, it is written to the logger dataspace.

If the HIGHOFFLOAD value is too high, there will not be enough room in the logstream to accommodate data being written to the logstream during offload processing. This can lead to a staging dataset full condition --- which causes log writes to be suspended. It's very important to factor in the peak times when calculating the logstream size and HIGHOFFLOAD values.

LOWOFFLOAD should be set between 40 and 60% for DFHLOG and DFHSHUNT, 0 for user journals.

If the extent size of the LS_DATACLAS (or the value specified in LS_SIZE) is too small, frequent DASD shifts (allocation of a new offload dataset) will occur. Frequent DASD shifts have a negative effect on performance and expose the system to a depletion of the offload datasets. The number of offload datasets is limited by the DSEXTENT value specified in the LOGR couple dataset. The DSEXTENT value defines the number of logger directory entries. Each directory can point to a maximum of 168 offload datasets. Prior to OS/390 R1.3 the number of extents was limited to 1; with R1.3 and above, the number is limited only by the amount of DASD available.

For user journals (including forward recovery logs), LS_SIZE should be specified large enough to contain several offloads, possibly a day's worth. DFHLOG and DFHSHUNT should only offload a minimal amount of data; however, all data is offloaded for user journals.

STG_SIZE is specified based on the amount of data to be contained in the logstream. The rule of thumb is it must be large enough to hold the data written during an activity keypoint interval plus the length of time of the longest running unit of work.

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Define DASDONLY Logstream Notes ...

DFHLSCU should be run against the R410 system log and the output used as a STARTING POINT for STG_SIZE.

LS_SIZE defines the allocation size for the offload datasets.   It should be specified large enough to contain several offloads, possibly a day's worth. DFHLOG and DFHSHUNT should only offload a minimal amount of data; however, all data is offloaded for user journals.
For user journals it is very important to specify LS_SIZE large enough to limit the number of times an additional dataset is allocated, as there can be large delays during the allocation process.

Note - if LS_SIZE and STG_SIZE are not specified in the logstream definition and an extent size is not specified in the LS_DATACLAS, the value is taken from the ALLOCxx parmlib member or set via an ACS (Automatic Class Selection) routine.   The default value in ALLOCxx is 2 tracks.   Refer to the *MVS Initialization and Tuning Guide*.

MAXBUFSIZE may be specified for a DASDONLY logstream, it defines the largest block that can be written to the logstream.   The default value is 65532.

STG_DUPLEX(YES) with DUPLEXMODE=(COND) are not applicable to DASDONLY logstreams.

With the exception of DFHLOG and DFHSHUNT, DASDONLY logstreams can be shared within the MVS image.   User journals and forward recovery logs fall into this category. Please note, this could have an impact on IOSQ time to the staging datasets.

It's also important to remember logstream staging and offload (log) datasets are single extent VSAM linear datasets, and the shareoptions MUST be specified '3,3'.   If the shareoptions are anything other than '3,3', there is a risk the logger will be unable to read offloaded data and post CICS with return code 8, reason code 804 (IxgRsnCodeNoBlock). This will cause CICS to abend with a DFHLG0772.

Another important point, if you have a DASDONLY user journal, which is shared between multiple CICS regions in the same image, you must ensure all the CICS regions sharing the journal always run on the same MVS image. If one CICS is moved to another image, only the first CICS region to connect to the logstream will be successful.

OFFLOADRECALL should be set to NO for CICS logstreams. This option was added via OW48404. Specifying NO indicates to the logger that if a required log dataset has been migrated via HSM, a new offload dataset is to be allocated. This prevents the logger from waiting for the recall and thus CICS is not put in a position where it is unable to write to a logstream.

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MVS Model Definition DFHLOG/DFHSHUNT

- **Associate log stream names, structure names and attributes.**
  - **The advantage is it's easier to setup**
  - **The disadvantage is all logstreams using the model have the same characteristics**

```
//DEFMODEL JOB CLASS=A,MSGCLASS=A
//MODDEF   EXEC  PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
```

DATA TYPE(LOGR) REPORT(YES)

DEFINE LOGSTREAM NAME(*sysname* .DFHLOG.MODEL) *sysname* - name of the MVS image

STRUCTNAME(LOG_DFHLOG_001)   Structure that will contain the data

DIAG(YES)   If an 804 (IXGRSNCODENOBLOCK) reason code will be
                                             given, a dump of the logger is taken before returning to CICS

HIGHOFFLOAD(85)   Threshold, expressed as a % of logstream
                                             space, when offloading is to take place

LOWOFFLOAD(60)   Value, expressed as a % of the space used
                                             by the logstream, of the offload target

LS_DATACLAS(LS10MEG)   SMS dataclass used for offload datasets

OFFLOADRECALL(NO)   <u>Always set to NO</u> for CICS logstreams (added by OW48404)

STG_DUPLEX(YES) DUPLEXMODE=(COND)   Log writes to be duplexed to the CF and
                                             Staging Datasets if CF becomes volatile

STG_SIZE(9000)   Number of 4K C.I.s in the Staging Dataset

MODEL(YES)   A model only, connection is not permitted

LS_SIZE(1000)   The number of 4K blocks for offload datasets allocation
                                             MSG IXG256I is issued if the value is less than 64K

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MVS Model Definition - User Journal

- **Models for user journals are named based on the _first two_ qualifiers in the logstream name. For example, the following model would be used for user journals such as IYOT1.IYO1.DFHJ03.**

```
//DEFMODEL JOB CLASS=A,MSGCLASS=A
//MODDEF   EXEC  PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
 DATA TYPE(LOGR)  REPORT(YES)
 DEFINE LOGSTREAM NAME(IYOT1.IYO1.MODEL)
 DASDONLY(YES)
 AUTODELETE(YES)
 DIAG(YES)
 RETPD(15)
 HIGHOFFLOAD(85)
 LOWOFFLOAD(00)
 LS_DATACLAS(LS10MEG)
 LS_SIZE(75000)

 OFFLOADRECALL(NO) *
 STG_SIZE(5000)
 MODEL(YES)
```

AUTODELETE(YES)	Logger will delete the data when the retention period (RETPD) has elapsed.
DIAG(YES)	If an 804 (IXGRSNCODENOBLOCK) reason code will be given, a dump of the logger is taken before returning to CICS
RETPD(15)	Retain the data for 15 days
HIGHOFFLOAD(85)	Threshold, expressed as a % of logstream space, when offloading is to take place
LOWOFFLOAD(00)	Value, expressed as a % of the space used by the logstream, of the offload target
LS_DATACLAS(LS10MEG)	SMS dataclass used for offload datasets
LS_SIZE(75000)	The number of 4K blocks for offload dataset allocation MSG IXG256I is issued if the value is less than 64K
OFFLOADRECALL(NO) *	Always set to NO for CICS logstreams (added by OW48404)
STG_SIZE(5000)	Number of 4K control intervals in the Staging Dataset
MODEL(YES)	A model only, connection is not permitted

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MVS Model Definition notes...

MVS models sysname.DFHLOG.MODEL and sysname.DFHSHUNT.MODEL are required entries in the LOGR policy if CICS is to dynamically create logstreams.   'sysname' is the name of the MVS image as specified in IEASYSxx in SYS1.PARMLIB.

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Define Structure -LOGR Policy

Sample job to define the CF structure to be used for logstreams.

```
//DEFSTR JOB CLASS=A,MSGCLASS=A
//POLICY EXEC PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=A
//SYSIN DD *

DATA TYPE(LOGR) REPORT(YES)

DEFINE STRUCTURE NAME(LOG_JG)        LOG_JG is the structure name
LOGSNUM(10)   *                       up to 10 logstreams can connect
AVGBUFSIZE(400)  *                     size of the starting 'average' buffer
                                        - monitor the 'effective average buffer'
                                          using IXCMIAPU

MAXBUFSIZE(64000)  *                  determines the size of each log buffer
                                       - also defines the CF element size
                                         > 65276   - element size is 512,
                                         = <65276 - element size is 256
```

*   parms which affect performance

Define Structure Notes - LOGR Policy

The size of a STRUCTURE is specified in the CFRM policy. Each STRUCTURE is divided into ENTRIES and ELEMENTs. Each write uses 1 ENTRY and 1 or more ELEMENTs based on the length of data written.

Each STRUCTURE is divided EQUALLY between the connected log streams. When another log stream connects to the structure, the space is dynamically redistributed.

MAXBUFSIZE is returned to CICS at connect time, this is the value used for internal log buffers.
For user journals, where the application does not use the wait option, it may be advantageous to specify a smaller size, as the buffer is flushed when filled.

MAXBUFSIZE in conjunction with AVGBUFSIZE is used to determine the CF structure ENTRY/ELEMENT ratio.
When data is written to the CF, it's written in increments equal to ELEMENT size. A MAXBUFSIZE greater than 65276 gives an element size of 512; a MAXBUFSIZE equal to or less than 65276 results in an element size of 256.   For example: MAXBUFSIZE(65532)   AVGBUFSIZE(1100)

CF element size is therefore 512 bytes, 3 elements are used for an average write.   The Entry/Element ratio is 1:3 .   Beginning with OS/390 R1.3, the Entry/Element ratio is dynamically adjusted.

When ENTRY space becomes 90% full, all logstreams in the structure are offloaded to DASD.

Monitor the 'effective average buffer' using IXCMIAPU
   LIST STRUCTURE NAME(LOG_JG) DETAIL(YES)
       STRUCTURE NAME(LOG_JG) LOGSNUM(10)
       MAXBUFSIZE(64000) AVGBUFSIZE(400)
       EFFECTIVE AVERAGE BUFFER SIZE(768)

Monitor via RMF Post Processor.

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Define Structure - CFRM policy

Sample job to define the CF structure to be used for logstreams.

```
//DEFSTR JOB CLASS=A,MSGCLASS=A
//POLICY EXEC PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
```

DATA TYPE(CFRM) REPORT(YES)

DEFINE STRUCTURE NAME(LOG_JG)	LOG_JG is the structure name
INITSIZE(20000) *	INITIAL CF size, specified in units of 1K
SIZE(35000) *	if larger than INITSIZE, allows for a rebuild up to the SIZE value, specified in units of 1K
PREFLIST(CF01,CF02)	specifies coupling facilities preference selection order for this structure
REBUILDPERCENT(1)	specify this value low so structures are rebuilt in the event of connectivity failure - a value of 1 indicates when 1% of the systems lose connectivity to a structure, MVS will initiate a rebuild
MINSIZE(1500)	specifies minimum structure size in units of 1K
ALLOWAUTOALT(NO) *	specifies if system-initiated alter processing is to be used for this structure
FULLTHRESHOLD(0) *	specifies a percent full value used by automatic alter processing and structure full monitoring

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Define Structure Notes - CFRM Policy

Three new parameters have been added to the define structure function in OS/390 R9 and 10.

MINSIZE (OS/390 R10) defines the smallest size to which the structure can be automatically altered.

FULLTHRESHOLD (OS/390 R9) specifies a percentage value used by automatic alter processing and structure full monitoring. This value represents a percent full threshold for the structure.   Specifying a value of 0 means no structure full monitoring or automatic alter processing is to be performed for the structure.

If ALLOWAUTOALT(YES) (OS/390 R10) is specified, the FULLTHRESHOLD value is used to monitor the structure. When the FULLTHRESHOLD value is reached, XCF will alert the installation using message IXC585E _AND_ automatically start an alter against the structure to relieve the storage shortage.   XCF will issue message IXC588I to the system log to externalize the alter request.

For structures which contain CICS DFHLOG and DFHSHUNT logstreams, FULLTHRESHOLD should be set to 0 and ALLOWAUTOALT set to NO.   Since CICS manages the logstreams by deleting unneeded records, the structure may appear to be under utilized and become a candidate for having some of the storage 'stolen' for other structures which are constantly over the threshold.

On the other hand, use of these options can provide diagnostic information for a structure experiencing problems, for example structure full conditions.

If the options are used and messages are displayed, information from the SMF 88 records should be used to tune the logstreams.

Additional information can be found in Info APAR II12815, and topic Define the Coupling Facility Structures Attributes in the CFRM Policy Couple Data Set in _OS/390 V2R10.0 MVS Setting Up a Sysplex (GC28-1779-10)_

Define Structure Notes - CFRM Policy ...

```
MV2C      01145 03:51:49.50            00000080 *IXC585E STRUCTURE LOG_JG2 IN COUPLING FACILITY SVCF04, 979
                                  979 00000080  PHYSICAL STRUCTURE VERSION B5E2748F D0885E02,
                                  979 00000080  IS AT OR ABOVE STRUCTURE FULL MONITORING THRESHOLD OF  80%.
                                  979 00000080  ENTRIES:  IN-USE:          930 TOTAL:        1105,  84% FULL
                                  979 00000080  ELEMENTS: IN-USE:         2401 TOTAL:        8841,  27% FULL


MV2C      01145 03:51:49.52            00000280  IXC588I AUTOMATIC ALTER PROCESSING INITIATED 980
                                  980 00000080  FOR STRUCTURE LOG_JG2.
                                  980 00000080  CURRENT SIZE:          3072 K
                                  980 00000080  TARGET SIZE:           3072 K
                                  980 00000080  TARGET ENTRY TO ELEMENT RATIO:        1192 :        3078
                                  980 00000080  TARGET EMC STORAGE PERCENTAGE: 0.00


MV2C      01145 03:51:58.30            00000280  IXC590I AUTOMATIC ALTER PROCESSING FOR STRUCTURE LOG_JG2 982
                                  982 00000080  COMPLETED.   TARGET ATTAINED.
                                  982 00000080  CURRENT SIZE:               3072 K  TARGET:        3072 K
                                  982 00000080  CURRENT ENTRY COUNT:        2921     TARGET:        2921
                                  982 00000080  CURRENT ELEMENT COUNT:      7542     TARGET:        7542
                                  982 00000080  CURRENT EMC COUNT:             0     TARGET:           0


MV2C      01145 03:52:53.33            00000080  IXC586I STRUCTURE LOG_JG2 IN COUPLING FACILITY SVCF04, 998
                                  998 00000080  PHYSICAL STRUCTURE VERSION B5E2748F D0885E02,
                                  998 00000080  IS NOW BELOW STRUCTURE FULL MONITORING THRESHOLD.
```

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LSN, data set names

- **Log Stream Name (LSN)**
  - **up to 26 characters in length**
    - ➤ xxxxxxxx.yyyyyyyy.zzzzzzzz
- **MVS LOGGER High Level Qualifier (HLQ)**
  - **optional parm when the logstream is defined in the LOGR policy**
  - **IXGLOGR is the default**
  - **NOT used by CICS**
- **Log Data Set name**
  - **often referred to as the offload data sets**
  - **HLQ.LSN.sequence#**
    - `GRAUEL.IYOT1.DFHLOG.A0000003`
- **Staging data set name -- used with coupling facility**
  - **HLQ.LSN.system_name**
    - ➤ system_name may be found in IEASYSxx, IEASYMxx or Loadxx parmlib members
      - `GRAUEL.IYOT1.DFHLOG.MV55`
- **Staging data set name -- used with DASD logging**
  - **HLQ.LSN.sysplex_name**
    - ➤ sysplex_name is specified as SYSPLEX() in the COUPLExx parmlib member
      - `GRAUEL.IYOT1.DFHLOG.PLEXB`

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LSN, data set names...

- ## USING ISPF

```
        DSLIST – Data Sets Matching GRAUEL.IYOT1.DFHLOG

        Command – Enter "/" to select action              Message           Volume

-----------------------------------------------------------------------------
   OFFLOAD dataset      GRAUEL.IYOT1.DFHLOG.A0000003                         *VSAM*
                        GRAUEL.IYOT1.DFHLOG.A0000003.DATA                    PBDA02
   STAGING dataset      GRAUEL.IYOT1.DFHLOG.PLEXB                            *VSAM*
                        GRAUEL.IYOT1.DFHLOG.PLEXB.DATA                       PBDA06
```

LSN = LogStream Name (IYOT1.DFHLOG)
HLQ = High level qualifier - specified on logstream definition (GRAUEL)
A0000003 is the offload dataset sequence number
PLEXB is the sysplex name indicating this is a staging dataset for a DASDONLY logstream

  - **Staging datasets are only allocated during the time there is a connection to the DASDONLY logstream or a CF logstream which is duplexing to the staging datasets. When CICS disconnects from the logstream the staging dataset is deallocated and freed by the logger**

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How does it tie together?

- **The log stream name used by CICS**
  - **must be defined in the LOGR policy**
  - **characteristics may be obtained from a model in the LOGR policy**
- **The log stream as defined in the LOGR policy**
  - **if using a coupling facility**
    - must be associated with a structure defined in the LOGR and CFRM policy
- **During an INITIAL start of the CICS region**
  - **1 locate the JOURNALMODEL - for example DFHLOG**
    - obtain the log stream name (LSN)
    - connect to the named logstream using an IXGCONN call to the logger
  - **2 if a JOURNALMODEL is not defined**
    - use the default log stream name **&userid..&applid..DFHLOG**
    - connect to the log stream via an IXGCONN call to the logger

  - **if the log stream is not defined in the LOGR policy**
    - using the LSN CICS derived in either step 1 or 2
    - CICS will issue an IXGINVNT call (to the MVS logger) to dynamically create the log stream specifying **sysname.DFHLOG.MODEL** in the **LIKE** parm
    - sysname.DFHLOG.MODEL must be defined as a MODEL to the LOGR

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DFHLG0508 & IXG231I

DEFINE JOURNALMODEL(CICSLOG)   GROUP(TEST)
        DESCRIPTION('DFHLOG LOGSTREAM USING A TEMPLATE DEFINITION')
        JOURNALNAME(DFHLOG)   TYPE(MVS)   STREAMNAME(SYSJ.GRAUEL.AOR1.DFHLOG)

DEFINE LOGSTREAM NAME(GRAUEL.AOR1.DFHLOG)
STRUCTNAME(LOG_FV_001) HIGHOFFLOAD(85) LOWOFFLOAD(60)
LS_DATACLAS(LS10MEG) STG_DUPLEX(YES) DUPLEXMODE=(COND)
STG_SIZE(9000)   MODEL(NO)   HLQ(SYSJ)

DO NOT specify the HLQ as part of the logstream name

IXG231I IXGCONN REQUEST=CONNECT TO LOG STREAM SYSJ.GRAUEL.AOR1.DFHLOG
        DID NOT SUCCEED FOR JOB IYK9R5. RETURN CODE: 00000008 REASON CODE:
        0000080B DIAG1: 00000008 DIAG2: 0000F801 DIAG3: 05030004 DIAG4: 05020010
+DFHLG0508 IYK95
        30/01/98 00:56:22 IYK95 Log stream SYSJ.GRAUEL.AOR1.DFHLOG not defined
        to MVS because model stream   SYSJ.DFHLOG.MODEL does not exist.

The model for *sysname*.DFHLOG.MODEL has not been defined to MVS

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RACF Authorizations Required

- **Refer to OS/390: MVS Setting Up a Sysplex**
  - **Define authorization for the System Logger Address Space**
  - **Authorization for System Logger Applications**
- **IXCMIAPU users**
  - **ALTER RESOURCE(MVSADMIN.LOGR) CLASS(FACILITY)**
    - Delete and define **log structures** in the LOGR policy, **read** access to list
  - **ALTER RESOURCE(log_stream_name)   CLASS(LOGSTRM)**
    - Define and delete **logstreams**
  - **UPDATE RESOURCE(IXLSTR.structure_name) CLASS(FACILITY)**
    - Define and delete **coupling facility logstreams**
  - **ALTER RESOURCE(IXLSTR.structure_name) CLASS(FACILITY)**
    - Define and delete **coupling facility structures** in the LOGR policy
- **Refer to CICS RACF Security Guide**
- **CICS regions - to create logstreams dynamically**
  - **ALTER RESOURCE(log_stream_name) CLASS(LOGSTRM)**
    - Allows CICS to **dynamically create** logstreams
  - **UPDATE RESOURCE(IXLSTR.structure_name) CLASS(FACILITY)**
    - Allows CICS to dynamically create logstreams in a **coupling facility structure**
- **CICS regions - where the logstreams have been predefined**
  - **UPDATE RESOURCE (log_stream_name) CLASS(LOGSTRM)**

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IXG003I .... UNEXPECTED ERROR

```
LINE #      CONTROL CARDS

   1        DATA TYPE(LOGR) REPORT(NO)
   2        DEFINE LOGSTREAM NAME(MARK.AASS56.DFHLOG)
   3                        STRUCTNAME(LOG_CHNGTEAM_001)
   4                        HLQ(SYS1)
ADMINISTRATIVE DATA UTILITY:  MESSAGES                    DATA TYPE = LOGR     03/09/1998
17:33:27


IXG005I LOGR POLICY PROCESSING LINE# 2
IXG033E USER DOES NOT HAVE SAF AUTHORIZATION TO PERFORM THE DEFINE REQUEST
IXG002E LOGR POLICY PROCESSING ENDED WITH RETCODE=00000008 RSNCODE=0000080D
IXG003I LOGR POLICY PROCESSING ENCOUNTERED AN UNEXPECTED ERROR.
                         DIAGNOSIS INFORMATION: 00000008 00000000 05050000 00000000


17.33.27 JOB07603   IEF403I DBALOGJO - STARTED - TIME=17.33.27
17.33.27 JOB07603   ICH408I USER(GRAUEL  ) GROUP(TSOUSER ) NAME(GRAUEL  (Jim)        )
                    IXLSTR.LOG_CHNGTEAM_001 CL(FACILITY)
                    INSUFFICIENT ACCESS AUTHORITY
                    FROM IXLSTR.** (G)
                    ACCESS INTENT(UPDATE )  ACCESS ALLOWED(NONE    )


LINE #      CONTROL CARDS

   1        DATA TYPE(LOGR) REPORT(NO)
   2        DELETE LOGSTREAM NAME(IYCPZC08.DFHLOG)
   3        DEFINE LOGSTREAM NAME(IYCPZC08.DFHLOG) MODEL(NO)
   4                STRUCTNAME(LOG_PF_001) LOWOFFLOAD(50) HIGHOFFLOAD(85)
   5                LS_STORCLAS(STAGEDS2) LS_DATACLAS(LS10MEG)


ADMINISTRATIVE DATA UTILITY:  MESSAGES                    DATA TYPE = LOGR     03/10/1998
09:08:18


IXG005I LOGR POLICY PROCESSING LINE# 2
IXG017E LOGSTREAM IYCPZC08.DFHLOG DOES NOT EXIST
IXG002E LOGR POLICY PROCESSING ENDED WITH RETCODE=00000008 RSNCODE=0000080B
IXG003I LOGR POLICY PROCESSING ENCOUNTERED AN UNEXPECTED ERROR.
                         DIAGNOSIS INFORMATION: 00000008 0000F801 05030004 05020010
Allocation error message from console ---
IXG251I IKJ56883I DATA SET IXGLOGR.IYCPZC08.DFHLOG.A0000000 NOT ALLOCATED,  REQUEST CANCELED
```

User does not have authority to delete and define structures

User does not have authority to allocate logger offload data sets (HLQ=IXGLOGR)

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Duplex data

- **Duplexing**
  - Each time a unit of work writes a log block to a log stream, the system logger automatically makes a duplicate copy of the data.
    - ➤ the IXGWRITE calls are issued under the QR TCB, hence the CPU time is charged to the transaction

- **Interim Storage**
  - where data can be accessed quickly - w/o I/O to long term DASD
  - for CF logstreams - the list structure in the coupling facility
  - for DASDONLY - the local buffers in the logger dataspace

- **Log or Offload datasets**
  - data offloaded from interim storage at HIGHOFFLOAD
  - hardened for longer term access
  - HSM can archive

- **Staging Dataset**
  - for DASDONLY logstreams, contains the duplexed copy
  - for CF logstreams, used for duplexing if the CF becomes volatile or is failure dependent (e.g. the CF LPAR and the MVS LPAR are in the same physical box)
    - ➤ STG_DUPLEX(YES) DUPLEXMODE=(COND)

User Journals and forward recovery logs

- **Contains user selected information**
  - **written by an application, old style 'auto journal' data**
    - ➤ **specified in the file control table entry as JOURNAL(xx)**
    - ➤ **independent of logging to the system and forward recovery logs**
    - ➤ **no synchronization with Units of Work like the system and forward recovery logs**
- **Buffers are flushed during a normal shutdown**
- **Buffers are *not* flushed during an immediate shutdown (CEMT P SHUT,I)**
- **To avoid loss of user journal records**
  - **use a normal shutdown with CESD active**
    - ➤ **provide a PLTSD program to issue a SET JOURNAL FLUSH**
    - ➤ **PLTSD programs are driven when using CESD**
    - ➤ **CESD may force an IMMEDIATE shutdown *after* the PLTSD is driven**
  - **use the WAIT option on writes to the user journal**
- **Do not oversize user journals and forward recovery logstreams**
  - ➤ **STG_SIZE or the size of the CF structure**
  - **All data is offloaded**
    - ➤ **the size should be much smaller than the size used in R4.1**
  - **causes excessive page frames to be allocated to the MVS logger**
  - **LS_SIZE should be defined large enough to hold the data with minimum DASD shifts**

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Define a new user journal

- **User journals, forward recovery logs, auto journals**
- **Determine the amount of data to be written in a given interval**
  - **understand how the data is generated**
    - ➤ based on VSAM, DB2, IMS, MQ records
    - ➤ file control recovery options
  - **define the amount of data written in the interval**
    - ➤ number of records to be written during the interval
    - ➤ average record size times the number of records written
    - ➤ add block header - decimal 40 byte header
    - ➤ add CICS information -144 bytes for user, 170 for forward recovery or auto journal
- **Define the interim storage residency time**
  - **forward recovery log is forced out at syncpoint**
    - ➤ For DASDONLY round the record size to a 4K boundary
    - ➤ For a CF logstream round the record size to 256 byte boundary
  - **user journal and auto journal - forced out when the buffer fills**
    - ➤ adjust with MAXBUFSIZE
- **Reduce the dataspace storage required**
  - **Adjust the logstream size to provide an even offload rate**
    - ➤ for DASDONLY adjust STG_SIZE and MAXBUFSIZE (logstream definition)
    - ➤ for CF logstreams adjust the structure size and MAXBUFSIZE (structure definition)

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Define a new user journal ...

- **Determine MAXBUFSIZE**
  - DASDONLY -- logstream definition
  - Coupling Facility -- structure definition in the LOGR policy
- **Determine the record size**
  - user journal -- data record + 68 bytes of CICS description
  - auto journal -- data record + keylength + 84 bytes for CICS description
  - forward recovery log - data record + keylength + 84 bytes for CICS
- **Define the data written within an interval -- suggest 1 second**
  - (transaction rate per second)*(records per transaction)*(record size)
  - # of data CIs = divide data written in 1 second by 4096, round up
- **Determine the buffer fill and spill (write to the logstream) rate**
  - MAXBUF CIs -- divide MAXBUFSIZE by 4096, round up
  - fill rate in seconds -- divide MAXBUF CI by # of data CIs
  - # buffer fills per minute -- divide 60 seconds by the fill rate
  - HIGHOFFLOAD value in CIs
    - ► multiply the MAXBUF CIs by the number of buffer fills per minute
- **STG_SIZE = HIGHOFFLOAD CIs times 1.18**
  - 1.18 is used when the HIGHOFFLOAD value is 85%
  - 1.25 is used when the HIGHOFFLOAD value is 80%

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Define a new user journal --notes ...

There are slight differences between a USER journal, a forward recovery log, and an auto journal.
A USER journal is written directly from an application, for example by the use of an EXEC CICS WRITE JOURNALNAME command. A forward recovery log is used to track 'after' images which will be used to recover the updates applied to an image copy of a VSAM file by a product such as CICS/VR. An auto journal may contain a combination of records based on the file definition parms JNLADD, JNLREAD, JNLSYNCREAD, JNLSYNCWRITE, JNLUPDATE, and JOURNAL.

The are also subtle differences in the amount of data written to the log/journal. In all cases, each block written will contain a x'28' (decimal 40) byte header. For user journals, CICS appends 68 bytes of information to each record written. For forward recovery and auto journal logstreams, 84 bytes of CICS information plus the length of the record key is appended to each record.

Refer to the CICS Customization Guide for information regarding the record format.

In the following descriptions the goal is to define the logstream so residency time is about 1 minute. Remember each of these logstreams falls into the non-system logstream category so CICS does not perform log tail management -- all data is offloaded. To reduce the overall impact to the MVS image, it is preferred to keep the residency time short thus reducing the overall working set for the logger.

Another difference occurs when the data is actually written to the logstream. For a user and auto journal, the write happens when the buffer fills. For a forward recovery log the data is written at syncpoint.

Several pieces of information are required:
MAXBUFSIZE for the logstream, average size, key length, and number of records written in a given interval, the CICS type logstream (USER, auto journal, forward recovery) and the physical type of logstream (C.F. or DASDONLY).

For a DASDONLY logstream, data is written in 4K (4096 bytes) control intervals (CI). Divide MAXBUFSIZE by 4096 to determine the number of CIs required to write the buffer, this also represents the number of pages required in the logger dataspace (for both DASDONLY and CF logstreams). When MAXBUFSIZE is set at 65532, it will hold up to 16 control intervals of data.

Define a new user journal --notes....

In the sample, there is one transaction (JORC) which writes to a user journal. It writes 80 byte records and there are 42 writes per task. The transaction rate is 6 transactions per second, running in sequential order.

For DASDONLY, MAXBUFSIZE is set to 65532. With a MAXBUFSIZE of 65532, subtract 40 bytes for the header, leaving 65492 bytes for data. Each record is 148 bytes (80 bytes of data plus 68 bytes of CICS information). Dividing 65492 by 148 yields a record count of 442 plus a remainder.

442 records * 148 bytes/record = 65416 + 40 header = 65456 bytes will be used in each buffer.

Since we know each transaction writes 42 148 byte records and the rate is 6 transactions a second, the data written in one second is 42*148*6= 37296 bytes per second. Divide 37296/4096 and rounding gives 10 CIs of data. The buffer holds 16 CIs of data so we fill the buffer every 1.6 seconds or 37.5 times a minute. 37.5 times 16 equals 600 CIs for a HIGHOFFLOAD set to 85%. Multiply 600 time 1.18 (100/85) equals a STG_SIZE of 708.

The results (the SMF interval is 5 minutes):

LOGSTREAM NAME--	STRUCTURE NAME--	BYT WRITTN BY USERS IXGWRITES	BYT WRITTN TO INTERIM STORAGE	BYT WRITTN TO DASD	#WRITES INVOKED	---# WRITES COMPLETED------ TYPE1	TYPE2	TYPE3	AVERAGE BUFFER SIZE

		BYT DELETD INTERIM ST W/O DASD	# DELETES W/O DASD WRITE	BYT DELETD INTERIM ST W/DASD	# DELETS W/ WRITE	---------------EVENT--------------- OFF- LOAD	DASD SHFT	STRC FULL	NTRY FULL	STG THLD	STG FULL	RE- BLD

12/02/02 5:25:00 PM   (SMF INTERVAL TIMESTAMP 'B89E460005300000'X)

LOGSTREAM NAME	STRUCTURE	IXGWRITES	INTERIM STORAGE	TO DASD	#WRITES/#DELETS	TYPE1/OFF-LOAD	DASD SHFT	TYPE2/STRC FULL	NTRY FULL	TYPE3/STG THLD	STG FULL	AVG BUF/RE-BLD
IYOT1.IYO1.DFHJ02	*DASDONLY*	11127520	11837440	11461800	170	0		0		0		65456
		0	0	12185600	179	5	0	0	0	5	0	0

For a CF logstream the process is the same, but you must determine how much of the structure will be occupied by the logstream. Another point to remember, is the data is rounded to a 256 byte boundary when the buffer is written (based on the MAXBUFSIZE of the structure). Using the same example, this time with a CF logstream which has a MAXBUFSIZE of 64000, 432 records can be written to the buffer ((64000-40)/148).

432 records * 148 bytes/record = 63936 + 40 header = 63976 bytes will be used in each buffer. The size is then rounded to a 256 byte boundary, making it 64000.

The buffer is filled each 1.7 seconds (35.3 times per minute) so the amount of data written in 1 minute is 35.3 times 64000 = 2,259,200 (2.2M plus a bit). Again assuming the HIGHOFFLOAD is 85%. 2.2M times 1.18 yields a 2.596M logstream (or structure if there is one logstream per structure) which can be used to provide a residency time of 1 minute.

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Define a new user journal --notes .....

<u>AUTO JOURNAL</u>

To size a DASDONLY auto journal, the process is much the same, however in this case CICS will add 84 bytes plus the length of the key to each block of data. The 40 byte header is also written at the beginning of each block. The sample used in this case is the same transaction (JORC) (without the writes to the user journal). It reads from a VSAM file and rewrites the same record, JNLUPDATE was specified for the file. The records are 80 bytes with a 6 byte key and the transaction rate is 6 per second, there are 30 log writes per task.

MAXBUFSIZE is set to 65532 (this is a DASDONLY logstream). Subtract 40 bytes for the header, leaving 65492 bytes for data. Each record is 170 bytes (80 bytes of data + 6 byte key + 84 bytes of CICS information). Dividing 65492 by 170 yields a record count of 385 plus a remainder.   385 records * 170 bytes per record + 40 header = 65490 bytes will be used in each buffer.

We know each transaction writes 30 170 byte records and the rate is 6 transactions a second, the data written in one second is 30*170*6 = 30600 bytes per second. Divide 30600/4096 and round up to 8 CIs of data. The buffer holds 16 CIs of data so we fill the buffer every 2 seconds or 30 times a minute. 30 times 16 equals 480 CIs for 85% HIGHOFFLOAD. Multiply 480 by 1.18 (100/85) equals a <u>STG_SIZE of 566</u>.   .

The results show an offload is happening about every 50 seconds.

```
12/01/02 11:15:00 PM   (SMF INTERVAL TIMESTAMP 'B89D525DB8500000'X)
IYOT1.IYO1.DFHJ03        *DASDONLY*   12901530    13717504    13761300       197       0          0          0       65490
                                             0           0    14622720       214       6    0    0    0       6    0    0
```

For a CF logstream the process is the same but you must determine how much of the structure will be occupied by the logstream. Another point to remember is the data is rounded to a 256 byte boundary when the buffer is written (based on the MAXBUFSIZE of the structure). Using the same example, this time with a CF logstream which has a MAXBUFSIZE of 64000, 376 records can be written to the buffer ((64000-40)/170).
376 records * 170 bytes/record = 63920 + 40 header = 63960 bytes will be used in each buffer. The size is then rounded to a 256 byte boundary, making it 64000.

The buffer is filled every 2.0 seconds (64000/30600) or 30 times per minute.   The amount of data written in 1 minute is 30 times (64000) = 1,920,000 (1.92M). Again assuming the HIGHOFFLOAD is 85%. 1.92M times 1.18 yields a 2.27M logstream (or structure if the intention is to have 1 logstream per structure) which can be used to provide a residency time of 1 minute.

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```
FORWARD RECOVERY LOGS
```

To size a DASDONLY forward recovery log the process is once again the same with the exception that records are forced out (written to the logstream) at syncpoint. In addition, the record volumes are usually higher because it is often used by many files.

In the sample the JORC transaction is used, and the transaction rate is 6 per second. Since the records are forced at syncpoint the number of records logged in the UOW must be understood.   In the sample, the transaction issues 7 read/updates followed by a rewrite in each UOW. The records logged are 80 bytes in length with a 6 byte key. There are multiple UOWs per task but that doesn't affect the result since the buffer is written during syncpoint processing.

Each record is 170 bytes (80 bytes of data + 6 byte key + 84 bytes of CICS information). The amount of data written for each UOW, is (7 records per UOW) * (170 bytes per record) + 40 (header) = 1230 bytes. So even though MAXBUFSIZE is set to 65532, the actual buffer space used is 1230 bytes per UOW. There are 6 UOWs per task. With a transaction rate of 6 transactions per second and writing 6 buffers (1 for each UOW), there are a total of 36 1230 byte buffer writes per second (44,280 bytes).

For DASDONLY, each buffer write requires a 4K CI, even though there are only 1230 bytes. Therefore, 36 CIs are used each second, 2160 (36*60) are used in a minute. In this case, 2160 CIs times 1.18 = a STG_SIZE of 2549 for a residency time of 1 minute.

The results show 1 offload per minute, note the number of staging thresholds is 55, indicating an average of 10 log writes were performed during each of the offload periods. Ten (10) isn't anything to worry about however, if the number begins to grow it may be an indicator of problems in the offload processing such as allocation of a new offload dataset. Another option would be to increase the size slightly.

```
12/02/02  8:25:00 PM  (SMF INTERVAL TIMESTAMP 'B89E6E3BB3F00000'X)
IYOT1.IYO1.DFHJ03        *DASDONLY*    11729280    39059456    12593320    9536   0      0      0      1230
                                             0           0    37609472    9182   5  0  0  0   55   0   0
```

For a CF logstream the process is the same but you must determine what percentage of the structure will be occupied by the logstream. Also remember the data is rounded to a 256 byte boundary when the buffer is written (based on the MAXBUFSIZE of the structure). Using the same example, this time with a CF logstream which has a MAXBUFSIZE of 64000, the size of the data written is 1230, rounded to a 256 byte boundary is 1280.   There will be 36 buffers written in a one minute interval, so the data written is 1280 * 36 = 46080 per minute. Since this is the HIGHOFFLOAD point, multiply by 1.18 to define the size of the structure. Again assuming the HIGHOFFLOAD is 85%, 1.18 * 46080 = 54374.4, or a 55K logstream (or structure for 1 logstream per structure) could be used to provide a residency time of 1 minute.

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User Journals

-LOGSTREAM NAME-	STRUCTURE NAME--	BYT WRITTN BY USERS IXGWRITES	BYT WRITTN TO INTERIM STORAGE	BYT WRITTN TO DASD	#WRITES INVOKED	---# WRITES COMPLETED------ TYPE1	TYPE2	TYPE3	AVERAGE BUFFER SIZE
		BYT DELETD INTERIM ST W/O DASD	# DELETES W/O DASD WRITE	BYT DELETD INTERIM ST W/DASD	# DELETS W/ WRITE	---------EVENT--------- OFF-LOAD	DASD SHFT	STRC FULL	NTRY FULL	STG THLD	STG FULL	RE-BLD
IYOT1.IYO1.DFHJ03	*DASDONLY*	3929280	4177920	3210840	60	0	0	0	65488
		0	0	3411968	50	7	17	0	0	7	0	0
IYOT2.IYO2.DFHJ03	*DASDONLY*	6130440	6488064	0	108	0	0	0	56763
		0	0	0	0	0	0	0	0	0	0	0

```
LOGSTREAM NAME(IYOT1.IYO1.DFHJ03) STRUCTNAME() LS_DATACLAS(LS10MEG) LS_MGMTCLAS() LS_STORCLAS() HLQ(GRAUEL)
MODEL(NO) LS_SIZE(50) STG_MGMTCLAS() STG_STORCLAS() STG_DATACLAS() STG_SIZE(500) LOWOFFLOAD(60)
HIGHOFFLOAD(85)  STG_DUPLEX(YES) DUPLEXMODE(UNCOND) RMNAME() DESCRIPTION() RETPD(0) AUTODELETE(YES)
DASDONLY(YES) DIAG(YES)          MAXBUFSIZE(65532)


LOGSTREAM NAME(IYOT2.IYO2.DFHJ03) STRUCTNAME() LS_DATACLAS(LS10MEG) LS_MGMTCLAS() LS_STORCLAS() HLQ(GRAUEL)
MODEL(NO) LS_SIZE(500) STG_MGMTCLAS() STG_STORCLAS() STG_DATACLAS() STG_SIZE(100000) LOWOFFLOAD(00)
HIGHOFFLOAD(85) STG_DUPLEX(YES) DUPLEXMODE(UNCOND) RMNAME() DESCRIPTION() RETPD(0) AUTODELETE(NO)
DASDONLY(YES) DIAG(YES) MAXBUFSIZE(65532)
```

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User Journal notes

User Journals must be viewed from a different perspective than DFHLOG and DFHSHUNT. There are two(2) major differences, all data is offloaded and CICS does not perform logtail management. Basically, user journals operate similar to journals in CICS/ESA.

In the report for IYOT1.IYO1.DFHJ03, we see there have been 7 offloads but 17 DASD shifts.   Looking an IXCMIAPU list logstream detail(yes), we see there are only 2 log (offload) datasets. The listing shows AUTODELETE(YES) and RETPD(0) have been specified.

When AUTODELETE(YES) is specified, the logger automatically physically deletes the log data whenever it is either marked for deletion (using the IXGDELET service or an archiving procedure) OR the retention period for all the log data in a data set has expired. With AUTODELETE(YES) and RETPD(0) specified, data is eligible for deletion as soon as it is written to the log stream.

```
    LOGSTREAM NAME(IYOT1.IYO1.DFHJ03) STRUCTNAME() LS_DATACLAS(LS10MEG) LS_MGMTCLAS() LS_STORCLAS() HLQ(GRAUEL)
    MODEL(NO) LS_SIZE(50) STG_MGMTCLAS() STG_STORCLAS() STG_DATACLAS() STG_SIZE(500) LOWOFFLOAD(60) HIGHOFFLOAD(85)
         STG_DUPLEX(YES) DUPLEXMODE(UNCOND) RMNAME() DESCRIPTION() RETPD(0) AUTODELETE(YES) DASDONLY(YES) DIAG(YES)
    MAXBUFSIZE(65532)


       LOG STREAM ATTRIBUTES:
     User Data:
       00000000000000000000000000000000000000000000000000000000000000000
       00000000000000000000000000000000000000000000000000000000000000000


    LOG STREAM CONNECTION INFO:
      SYSTEMS CONNECTED: 0
    LOG STREAM DATA SET INFO:


    DATA SET NAMES IN USE: GRAUEL.IYOT1.IYO1.DFHJ03.<SEQ#>
    Ext.    <SEQ#>     Lowest Blockid     Highest GMT         Highest Local        Status
    -----   --------   ----------------   -----------------   -----------------    -------------------------
   *00001  A0000170   000000000217956B   10/18/01 17:50:40   10/18/01 18:50:40
           A0000171   00000000021A9553   10/18/01 19:59:59   10/18/01 20:59:59    CURRENT


      NUMBER OF DATA SETS IN LOG STREAM: 2
```

LOWOFFLOAD should be set to 0 for a user journal. When all data is to be offloaded, it's more efficient to move all the data in a single operation. The offload dataset size (LS_SIZE of 50) should be increased to reduce the number of DASD shifts.

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Logstream offloads

- **Optimize use of the interim storage**
- **MVS Offload processing**
  - **preferred**
    - ➤ triggered by HIGHOFFLOAD value
    - ➤ when the last connector to a log stream disconnects
  - **non-preferred**
    - ➤ **having 90% of the CF structure entries in use**
    - ➤ **logstream full**
    - ➤ **staging dataset full**
    - ➤ **structure rebuild**
    - ➤ **recovery processing**
  - **physically delete any logically deleted records**
    - ➤ IXGDELET calls issued for log tail management on DFHLOG and DFHSHUNT
  - **if required, move oldest records to the offload (LOG) dataset until LOWOFFLOAD value is reached**
  - **perform housekeeping in the dataspace**

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LOG (OFFLOAD) dataset deletion

AUTODELETE(NO) RETPD(0)	Log datasets are eligible for deletion when <u>all data has been deleted</u> via an IXGDELET call. This combination must always be used for DFHLOG and DFHSHUNT.
AUTODELETE(NO) RETPD(xx)	All data is offloaded from interim storage to the offload (log) datasets. Log datasets are eligible for deletion when <u>all data has been deleted</u> via an IXGDELET request **and** the <u>retention period has expired</u>. This combination should not be used for DFHLOG and DFHSHUNT.
AUTODELETE(YES) RETPD(xx)	All data is offloaded from interim storage. Log datasets are eligible for deletion when **either** <u>all the data has been deleted</u> or the <u>retention period has expired</u>. This combination should not be used for DFHLOG and DFHSHUNT.
AUTODELETE(YES) RETPD(0)	Log datasets are deleted <u>when the next log dataset is allocated</u>. This combination should not be used for DFHLOG and DFHSHUNT as it is possible for recovery data to be deleted, making backout impossible.

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LOG (OFFLOAD) dataset deletion notes

The RETPD parameter allows you to specify a retention period for log stream data. With RETPD, you specify the number of days the data in the logstream is to be kept, even if the data has been marked for deletion using IXGDELET. For example, if you specify RETPD(7) in the LOGR policy for a log stream, the retention period for data in that log stream is 7 days from the time the data is written to the log stream by the application. System logger processes the retention period on a log data set basis. Once the retention period for the <u>entire log data set</u> has expired, the data set is eligible for deletion. System logger may not physically delete data as soon as it hits the retention period. The point at which system logger physically deletes the data depends on when the data set fills and what you specify on the AUTODELETE parameter.

Note system logger retention period <u>applies to the age of the log data</u>, not the data set.

 AUTODELETE(NO) means the log data can be physically deleted only after the log data has been marked for deletion via IXGDELET and after any retention period specified for the log stream has expired. AUTODELETE(NO) is the default.

 AUTODELETE(YES) means log data can be physically deleted either when the data is marked for deletion or when a retention period specified for the log stream expires. Use care when specifying AUTODELETE(YES), automatic deletion is designed to speed physical deletion of log data, which can mean deletion of data needed by CICS for backout or recovery.

AUTODELETE and RETPD can have a disastrous effect on the DFHLOG and DFHSHUNT if specified other than AUTODELETE(NO) and RETPD(0). With RETPD>0, even though CICS attempts log tail management, all data will be offloaded to the offload datasets and held for the number of days specified for RETPD. AUTODELETE(YES) lets the logger (rather than CICS) decide when to delete the data. When a new offload dataset is allocated and AUTODELETE(YES) is specified without a retention period, the logger will delete the data on the old offload dataset. If CICS needs the data for backout, the result will be an 804 return code and CICS will terminate with a DFHLG0772.

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HSM Considerations

As noted under Log or Offload datasets, Hierarchical Storage Manager (HSM) may be used to manage these datasets. However, caution should be used when allowing HSM to manage any logger datasets. Staging datasets and the offload datasets for DFHLOG and DFHSHUNT should NOT be under the control of HSM.

If SETSYS INTERVALMIGRATION has been specified in the ARCCMDxx, HSM will, on a regular interval (default is 90 minutes) examine the managed volumes to see if the allocated space is over the high threshold. If the high threshold has been reached it will begin the migration of datasets to reach the low threshold value.

When HSM is about to migrate (or restore) a dataset, it holds the serialization lock (ENQ) for the file. If the logger attempts to allocate or connect to the file , Media manager (a component of DFSMS) will return an error. The error as presented does not indicate a temporary condition, so it is treated as though the file is inaccessible and a gap-type error or an offload failure is returned to CICS based upon which operation is in progress.
Examples would be return code 8, reason code 84A, or return code 4 with reason code 403.

CICS treats this as a log integrity error and terminates with message DFHLG0772.

If this type of error is being encountered, examine the CICS joblog and MVS console log for messages issued by the underlying infrastructure. For example, it is common to see message IEC161I 052(015)-084,IEESYSAS,IXGLOGR,..............
 IEC161I 052(015)-084 for a serialization type problem.
    052 indicates an open failure
    (015) sub function code - indicates a problem opening the dataset with share options (2,x) dataset for output,
           an exclusive ENQ request has been rejected - indicating another ACB has the
           dataset open for output
    084 indicates a problem sharing the dataset
Notice the jobname is IXGLOGR.

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HSM Considerations ...

Another common example is IEC161I 052(009)-084,IEESYSAS,IXGLOGR,................,
   (009) sub function code indicates the open failed for a shareoption (1,x) dataset for output, an exclusive ENQ
    request has been rejected - indicating another ACB has the dataset open

Shareoptions for staging and log datasets must be set to 3,3.

Either an IDCAMS LISTCAT or ISMF display may be used to verify the SHAREOPTIONS are set to 3,3.

An interesting side note here is the first offload dataset is allocated as part of logstream definition, but it is not actually
opened until needed for an offload or possibly during the heartbeat health check. Based on logging activity and how well
interim storage is tuned, it might be several hours or longer, before the offload dataset is needed.

Interactive Storage Management Facility (ISMF) can be used to display the HSM variables by dataset and group.
Refer to examples in the appendix.

Reference material :
  z/OS MVS Setting Up a Sysplex SA22-7625-03
        9.4.5.7 Set Up the SMS Environment for DASD Data Sets
        9.4.9.3 Specifying SMS Data Set Characteristics for DASD Data Sets

  DFSMS/MVS DFSMSdfp Storage Administration for SMS class and group considerations:
        1. Storage groups identify volumes to be used for data set allocation.
        2. Storage classes describe the performance characteristics for the data sets.
        3. Data classes specify the data set characteristics and size of the data sets.
        4. Management classes specify the migration characteristics of the data sets.
        5. Automatic class selection (ACS) routines to assign the storage groups, classes, data classes and
           management classes, based on data set name when the DASD data sets are allocated.

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HSM Considerations ....

Cross-region SHAREOPTIONS 1: The data set can be shared by any number of users for read processing, or the data set can be accessed by only one user for read and write processing. With this option, VSAM ensures complete data integrity for the data set. This setting does not allow any type of non-RLS access when the data set is already open for RLS processing.

Cross-region SHAREOPTIONS 2: If the data set has not already been opened for record-level sharing (RLS) processing, the data set can be accessed by any number of non-RLS users for read processing and it can also be accessed by one non-RLS user for write processing. With this option, VSAM ensures write integrity by obtaining exclusive control for a control interval when it is to be updated.

Cross-region SHAREOPTIONS 3: The data set can be fully shared by any number of users. With this option, each user is responsible for maintaining both read and write integrity for the data the program accesses. This setting does not allow any type of non-RLS access when the data set is already open for RLS processing. This option requires that the user's program use ENQ/DEQ to maintain data integrity while sharing the data set, including the OPEN and CLOSE processing. User programs that ignore the write integrity guidelines can cause VSAM program checks, lost or inaccessible records, uncorrectable data set failures, and other unpredictable results. This option places responsibility on each user sharing the data set.

Cross-region SHAREOPTIONS 4: The data set can be fully shared by any number of users, and buffers used for direct processing are refreshed for each request. This setting does not allow any type of non-RLS access when the data set is already open for RLS processing. With this option, as in SHAREOPTIONS 3, each user is responsible for maintaining both read and write integrity for the data the program accesses. Refer to the description of SHAREOPTIONS 3 for ENQ/DEQ and warning information that applies equally to SHAREOPTIONS 4.

Cross-system SHAREOPTION 3: The data set can be fully shared. With this option, the access method uses the control block update facility (CBUF) to maintain integrity. As in cross region SHAREOPTIONS 3, each user is responsible for maintaining both read and write integrity for the data accessed by the program. User programs that ignore write integrity guidelines can cause VSAM program checks, uncorrectable data set failures, and other unpredictable results. This option places heavy responsibility on each user sharing the data set. The RESERVE and DEQ macros are required with this option to maintain data set integrity.

Cross-system SHAREOPTION 4: The data set can be fully shared, buffers used for direct processing are refreshed for each request.

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Offload Problems

- **Incorrect size specifications**
  - *offloading data from DFHLOG and DFHSHUNT*
- **Wait for HSM recall of an offload dataset**
  - *ensure OFFLOADRECALL is set to NO*
- **On a fast processor where CICS (R1.3) is waiting for work**
  - *the ICV value can pre-empt the setting for LGDFINT*
    - set ICV low (100) - beware this could cause CICS to be re-dispatched early in a low volume region
    - Refer to PQ48163 and PQ57850 - corrected in CICS Transaction Server R2.2
- **Failing to trim the tail of DFHLOG**
  - *Setting a large value in for AKPFREQ*
    - tail trimming happens during activity keypoint processing
  - *Long running units of work which do not issue syncpoints*
  - *CSKP pointing to DFHAKP rather than DFHRMXN3*
- **Large numbers of DASD shifts**
  - *LS_SIZE is specified too small*
- **The coupling facility being volatile or failure dependent**
  - *causes duplexing to a staging dataset rather than the dataspace*

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Disaster Recovery

- **Logstreams can _NOT_ be simply transported**
  - **i.e. carry the datasets to the Disaster Recovery site**
  - **CICS must be _INITIAL_ started**

- **Geographically Dispersed Parallel Sysplex (GDPS)**
  - **DASD logstreams can be mirrored**
  - **logger couple dataset mirrored**
  - **CICS can be emergency started**

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GDPS Supports Two Data Mirroring Technologies

- **Peer to Peer Remote Copy** (PPRC)
  - **Synchronous** data mirroring

GDPS/PPRC

- GDPS manages secondary data consistency
  - No or limited data loss in failover
- Production site exception condition monitoring
  - GDPS initiates and executes failover
- Distance between sites up to 40KM (fiber)
- Continuous Availability and Disaster Recovery solution

- **eXtended Remote Copy** (XRC)
  - **Asynchronous** data mirroring
  - Limited data loss to be expected in unplanned failover

GDPS/XRC

- XRC manages secondary data consistency
- GDPS executes parallel sysplex restart
  - limited user involvement
- Supports any distance
- Disaster Recovery solution

S/390 z/OS

UNIX NT

ESCON

SDM

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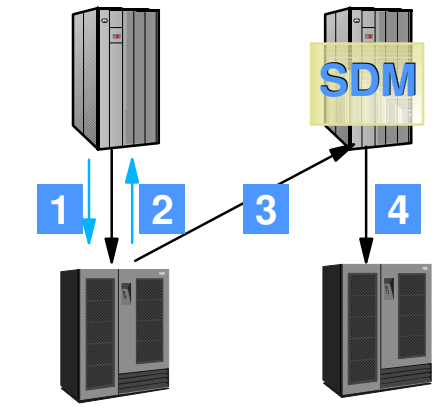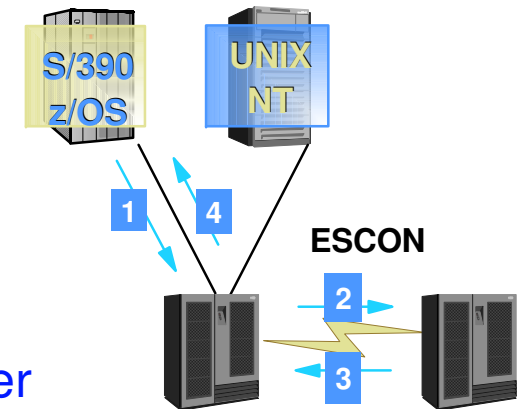
GDPS Data Mirroring Technologies notes

GDPS Supports Two Data Mirroring Technologies:

Peer to Peer Remote Copy - PPRC

PPRC is a synchronous data mirroring technology: data is committed to both primary and secondary subsystems before the write is confirmed to be complete. As a consequence, this technology is sensitive to performance impact as the distance between primary and secondary subsystems increases. The maximum distance is around 40 Km.   This limit is imposed by the Sysplex timer configuration - the distance between primary and secondary disk subsystems could be up to 103 Km (IBM Enterprise Storage System).

With a synchronous mirroring technology secondary data consistency does not come automatically: it needs to be managed . This provides one of the main reasons for the existence of GDPS. GDPS/PPRC is already a Continuous Availability solution: it makes major improvements to application availability by automating error detection and error response.

Extended Remote Copy - XRC

Due to risks mostly related to environmental hazards, such as earthquakes, blizzards, hurricanes and flooding, some enterprises need disaster protection with a failover site outside their primary site region. In this case, ESCON (Enterprise Systems CONnection) or even FICON (Fiber Connection (S/390 channel, replacement for ESCON) technology might no longer be feasible and telecom facilities have to be used so that two IT facilities can be connected over large distances.

Propagation delays resulting from long distances mean that in many cases synchronous data mirroring would have too much performance impact. That is the main reason for the existence of extended Remote Copy (XRC), a software centric data mirroring solution that operates asynchronously: updating of secondary devices is not time-coordinated with the updating of the primary devices.

It is important to remember that since the copy technology is asynchronous, some data loss is to be expected in a failover.

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CICS Messages

```
DFHPA1101  IYK91     DFHSITDZ IS BEING LOADED.
DFHPA1108  IYK91     DFHSITDZ HAS BEEN LOADED. (GENERATED AT: MM/DD= 07/18 HH:MM= 19:14).
DFHPA1100  IYK91     OVERRIDE PARAMETERS FROM JCL EXEC STATEMENT: SIT=DZ,SYSIN
DFHPA1102  IYK91     OVERRIDE PARAMETERS FROM SYSIN:
DFHPA1927  IYK91       AKPFREQ=200
DFHPA1927  IYK91       START=AUTO
DFHPA1927  IYK91       SPOOL=YES,DUMPDS=A
DFHPA1103  IYK91     END OF FILE ON SYSIN.
DFHLG0101I IYK91     Log manager domain initialization has started.
DFHSI1500  IYK91     CICS for MVS/ESA Version 5.1.0 Startup is in progress.
DFHRM0141  IYK91     Recovery manager autostart override record is not present. Normal processing continues.
DFHLG0103I IYK91     System log (DFHLOG) initialization has started.
DFHLG0104I IYK91     System log (DFHLOG) initialization has ended.
DFHLG0103I IYK91     System log (DFHSHUNT) initialization has started.
DFHLG0104I IYK91     System log (DFHSHUNT) initialization has ended.
DFHLG0102I IYK91     Log manager domain initialization has ended.


DFHRM0201 10/12/97 17:36:43 IYK91 0 backout-failed and 1 commit-failed UOWs were reconstructed.


DFHRM0205 11/12/97 16:47:57 IYK91 An activity keypoint has been successfully taken.
DFHLG0743 11/12/97 16:47:57 IYK91 Tail of log stream REESMK.IYK91.DFHLOG deleted at block id X'0000000524C388B0'.
DFHLG0743 11/12/97 16:47:58 IYK91 Tail of log stream REESMK.IYK91.DFHSHUNT deleted  block id X'0000000100141959'


DFHRM0205 11/12/97 16:49:04 IYK91 An activity keypoint has been successfully taken.
DFHLG0743 11/12/97 16:49:04 IYK91 Tail of log stream REESMK.IYK91.DFHLOG deleted at block id X'0000000524C5354E'.
. . . . . . . . . . . . . . . . . . . . . . .


DFHRM0205 11/12/97 16:54:37 IYK91 An activity keypoint has been successfully taken.
DFHLG0743 11/12/97 16:54:37 IYK91 Tail of log stream REESMK.IYK91.DFHLOG deleted at block id X'0000000524CE236F'.
DFHLG0743 11/12/97 16:54:37 IYK91 Tail of log stream REESMK.IYK91.DFHSHUNT deleted  block id X'0000000100142883'.
```

DFHLG0760 02/02/02 IYOT1 Log stream IYOT1.DFHLOG not trimmed by keypoint processing. Number of keypoints since last trim occurred: 20
 - added by PQ34528

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Hot APARs

- **PQ56315 (R1.3) and PQ56341 (R2.2)** - corrects the 'forget flow' problem
- **PQ57850 (R1.3) part of R2.2 base code**
  - performance degradation when using CF logstreams
- **PQ55329 (R1.3) and PQ56673 (R2.2)**
  - remove the AKP records from count towards the next activity keypoint
- **PQ60334 (R1.3) and PQ60307 (R2.2)** - ABEND0C4 in DFHL2WF in CSKP
- **PQ62287 (R1.3) and PQ62282 (R2.2)** - PE against PQ60334 and PQ60307
- **PQ66054 (R2.2) (HIPER)**
  - DFHLG0760 DFHLG0772 RC085D indicating DFHLOG is full
- **PQ70064 (R2.2) NEW** - DFHLSCU add comments concerning LS_SIZE

- **OW48404 CICS hang for logger recall of an offload dataset**
- **OW49755 (OS/390 and z/OS)**
  - extended CICS startup times connecting to DFHLOG and DFHSHUNT
- **OW56055**
  - recall attempted for offload dataset even though OFFLOADRECALL(NO) specified in logstream definition

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References

- *OS/390 MVS Setting Up a Sysplex - GC28-1779*
  - **Lists other useful publications in Chapter 9:**
    - ➤ **Finding Information for CICS Log Manager in topic**
    - ➤ **Finding Information for OPERLOG Log Stream in topic**
    - ➤ **Finding Information for Logrec Log Stream in topic**
- *MVS Diagnosis: Tools and Service Aids - LY28-1085, Chapter 13*
- *OS/390 MVS Assembler Services Guide - GC28-1762*
- *MVS Programming: Authorized Assembler Services Reference,*
  - *Volume 2 - GC28-1765*
  - *Lists return and reason codes and symbols*
    - ➤ *For example ---- 08 | xxxx0804 | Equate Symbol: IxgRsnCodeNoBlock*
- *OS/390 Parallel Sysplex Configuration Cookbook,*
  - *Vols. 1-3, SG24-2075, SG24-2076, SG24-2077*
    - ➤ *(See Vol. 2, SG24-2076 for Logger info)*

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References

- *CICS Transaction Server for OS/390 Version 1 Release 3*
  - *Migration Guidance*
  - *Installation Guidance Chapter 20*
- *CICS Transaction Server for OS/390 Version 1 Release 2 Implementation Guide -(Redbook) - SC24-2234*

- *Sample XLGSTRM exit*
  - *available via a ServerPac*
  - *http://www-4.ibm.com/software/ts/cics/txppacs/cs1e.html*
  - *DFH$LGLS is available in CICS Transaction Server R2.2 Samplib*

Summary

- **Understand the workload**
  - **length of the longest running unit of work**
  - **logstream characteristics**
    - **DFHLSCU output**

- **Offload and staging datasets must be defined (shareoptions '3,3')**

- **HIGHOFFLOAD**
  - **80 to 85% for all logstreams**
- **LOWOFFLOAD**
  - **40 to 60% for DFHLOG and DFHSHUNT**
  - **0% for user journals**

- **Apply all APARs w/keyword 'LOGRSERVICE'**
  - **MVS Logger serviceability improvements**

- **Apply all CICS APARs w/keyword 'CICSLOGR'**
  - **CICS logger function**

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- **Problems to avoid**
- **Neat things to know**
- **Sample SMS Constructs**
- **OS/390 setup**
- **Data gathering tips**
  - **SLIP trap**
  - **Offload time**
  - **Printing logstreams**
- **OW27153 -- Display Logger command**

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Problems to avoid

- **DFHLSCU - no records found on journal**
  - **DCB=RECFM=VB must be specified**
  - If **INTERVAL(0)** is specified, sizing will be large enough to hold **ALL** data in the R4.1 journal
- **Offload dataset allocation errors - reason code 805**
  - **indicates logger has received an error from underlying services**
    - RACF, DFSMS, ACS Routines, and DADSM
  - **can be seen off-line (IXCMIAPU) and during CICS startup**
    - if the logstreams are not predefined in the LOGR policy
  - **ensure the logstream name is 26 characters or less**
  - **insufficient RACF authorization**
    - IXG003I LOGR POLICY PROCESSING ENCOUNTERED AN UNEXPECTED ERROR. DIAGNOSIS INFORMATION: 00000004 00000402 0107001B 00000000
  - **insufficient space available**
  - **check for related product messages**
    - IXG251I in the system log
    - IXG231I in the CICS job log
    - IGDxxx messages (DFSMS) in the system log
    - ICH408I in the system log
    - IECxxx messages

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Problems to avoid ...

- **Large number of DASD shifts (allocation of offload datasets)**
  - **check LS_SIZE on logstream definition**
  - **extent size in data class**
  - **extent size in ALLOCxx member of SYS1.PARMLIB**
- **IXG002E - RETCODE=00000008 RSNCODE=0000080B**
  - **insufficient authority to delete/define offload datasets**
- **IXG002E - RETCODE=00000008 RSNCODE=0000080D**
  - **insufficient authority to delete/define structures**
- **IXG002E - RETCODE 00000008 RSNCODE 00000814**
  - **SYSPLEX is in LOCAL mode (PLEXCFG= XCFLOCAL)**
    - **specified in the IEASYSxx member of SYS1.PARMLIB**
- **IXG254I SMS IS NOT INSTALLED**
  - **the SMS address space must be active for allocation of offload and staging datasets**
- **IXG256I**
  - **size specified in LS_SIZE or the extent size specified in either the SMS DATACLASS or ALLOCATxx parmlib member is less than 64K**

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Problems to avoid ....

- **DFHLG0508**
  - **MVS model stream does not exist**
    - **model for *sysname*.DFHLOG.MODEL has not been defined to MVS**
- **DFHLG0777 reason code 868**
  - **A temporary error condition occurred during MVS logger operation**
  - **NOTE - it is normal to see one of these messages at connect time during CICS startup when the staging dataset is being allocated**
    - **the number of 868 errors returned during startup depends on staging D.S. size**

- **Log Tail deletion not happening on DFHLOG or DFHSHUNT**
    - **(there are no DFHLG0743 messages)**
  - **AKPFREQ=0**
  - **AUTODELETE(YES) with RETPD>0**
  - **long running tasks**
  - **Keypoint task (CSKP) abend**
    - **CSKP pointing to DFHAKP in a user group migrated from R410**
  - **SYSLOG=KEEP (CTS 1.1 only)**

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Problems to avoid .....

- **DFHLG0772 MVS logger codes: X'00000004', X'00000403'.**
  DFHLG0772 MVS logger codes: X'00000008', X'0000084A'.
  - **with associated message IEC161I 052(009)-084**
    - **error opening a shareoption 1,x dataset**
  - **or message IEC161I 052(015)-084**
    - **error opening a shareoption 2,x dataset**
  - **logstream datasets _must_ be defined with shareoption (3,3)**

- **DFHLG0772 reason code 80C**
  - **with associated message**
    IXG251I RETURN CODE IS 68 REASON CODE IS 20 IGG0CLEW
  - **insufficient DASD space for dataset allocation**
    - **this could be related to the SMS storage group or the volumes selected by ACS (Automatic Class Selection) routines**

- **DFHLG0777 reason code 865 - Staging Dataset full**
  - **see log tail deletion above**
  - **increase STG_SIZE on the logstream definition**

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Problems to avoid ......

- **System page rate is too high**
  - **reduce the structure or staging dataset sizes**
- **Response Time problems**
  - **LG_DEFER or LG_FORCE waits**
  - **LGDFINT SIT parm may be used to reduce the 30ms delay waiting for additional records to be placed in the buffer**
    - **Note the default in R2.2 is 5ms**
  - **refer to PQ17925 and PN87988**
- **Unnecessary log records for read only mirror (CSMI) tasks**
  - **extra MRO sequence set records for read only mirrors**
  - **PQ32338 corrects the problem**
- **IEF196I ICH408I JOB(IEESYSAS) STEP(IXGLOGR)**
  - **The IXGLOGR address space and the userid assigned can be given the *trusted* attribute (via either the STARTED class or ICHRIN03).**

    or

  - **The appropriate PERMITs can be issued for the resources accessed by the address space, using the userid assigned.**
  - **Refer to Setting Up a Sysplex**
    - **Define Authorization for the System Logger Address Space**

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Problems to avoid ......

- **DFHJUP - problems with LASTRUN option**
  - refer to PQ26852 and PQ31259 for documentation changes in the use of LASTRUN with COMPAT41V
    - the control card should be:
    - //   SUBSYS=(LOGR,DFHLGCNV,,'COMPAT41V,LASTRUN')
  - MVS Logger APAR OW40632 should be installed

Transaction & Messaging Technical Conference

Neat things to Know

- **HSM is NOT required**
  - **although it does make management of offload datasets easier**
  - **HSM should not be used for DFHLOG and DFHSHUNT**
  - **even though HSM archives the dataset, it is still counted in the logger inventory (i.e. one of the datasets in an extent)**
  - **it is very important to have *ALL* logstream datasets defined with shareoptions(3,3)**

- **Ensure multiple systems have connections to log structures**
  - **allows for peer recovery when a system fails**
  - **logger instances only connect to structures to which they have an interest and only when requested**

- **AUTODELETE and RETPD >0 (can be used for *user journals*).**
  - **the customer will not be required to have delete jobs, but it does mean the inventory can grow significantly**

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Neat things to Know ...

- **Do NOT use IDCAMS to print a logstream**
  - **may NOT show the data from an offload dataset**
    - When the offload dataset is allocated it is opened EXCLUSIVE, formatted and the high RBA is set to the CISIZE. It is then closed and reopened SHARE
    - LOGGER tracks high the RBA of log datasets in the OCONTROL part of the couple dataset
    - the RBA is not updated in VSAM until the offload dataset fills and an additional dataset is allocated
    - using IDCAMS to print will normally only print the initial data.
  - **a utility such as DFHJUP which calls logger services is required**

- **Use DFHJUP to copy and delete data from the offload datasets (i.e.. for a user journal) with RETPD=0**
  - **on the next allocation of an offload dataset, the data is physically deleted, when the complete dataset is deleted, the DASD space is returned to MVS and the inventory count will be reduced by 1**

- **Use IXCMIAPU with LIST LOGSTREAM DETAIL(YES)**
  - **obtain information logstream, i.e. low valid blockid, and high timestamp**

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Neat things to know....

- **Log stream data sets**
  - *Only MVS logger utilities should cause their deletion*
  - *Migration is OK*
    - **Logger detects migrated data sets and handles their recall.**
  - *Allocated exclusive when created/deleted, otherwise allocated shared*
  - *May see N-1, N and N+1 log stream data sets allocated even when no browse operation is in effect. This is not a problem.*
  - *Log stream is written to the offload dataset(s) when last connected region disconnects*
    - **during a CICS shutdown all logstreams are offloaded**
    - **note -- user journal buffers are only flushed during normal shutdown**

- **Staging datasets (both CF and DASDONLY) are released**
  - *once the data has been offloaded when the last connection is deleted*

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SMS Constructs notes ....

```
DATA CLASS DEFINITION
------------------------
CDS Name   . . . : ACTIVE
Data Class Name : LOGGER

Description :
Recorg . . . . . . . . . : LS
Recfm  . . . . . . . . . :
Lrecl  . . . . . . . . . :
Keylen . . . . . . . . . :
Keyoff . . . . . . . . . :
Space Avgrec . . . . . . : M
        Avg Value  . . . . : 1
        Primary  . . . . . : 10
        Secondary  . . . . :
        Directory  . . . . :
Retpd Or Expdt . . . . . :
Volume Count . . . . . . : 1
  Add'l Volume Amount  . :
Imbed  . . . . . . . . . :
Replicate  . . . . . . . :
CIsize Data  . . . . . . :
% Freespace CI . . . . . :
            CA . . . . . :
Shareoptions Xregion . . : 3
             Xsystem . . : 3
Compaction . . . . . . . :
Media Interchange
  Media Type . . . . . :
  Recording Technology :
Data Set Name Type  . . . :
  If Extended . . . . . . :
  Extended Addressability : NO
Reuse . . . . . . . . . : NO
Initial Load  . . . . . : RECOVERY
```

```
STORAGE CLASS DEFINITION
------------------------
CDS Name   . . . . . : ACTIVE
Storage Class Name  : LOGPLEXE
Description  : MVS SYSTEM LOGSTREAMS FOR PELPLEXE
Performance Objectives
   Direct Millisecond Response  . . . : 5
   Direct Bias  . . . . . . . . . . . : WRITE
   Sequential Millisecond Response  . : 5
   Sequential Bias  . . . . . . . . . : WRITE
   Initial Access Response Seconds  . :
   Sustained Data Rate (MB/sec) . . . :
Availability . . . . . . . . . . . . : NOPREF
Accessibility  . . . . . . . . . . . : CONTINUOUS
PREFERRED
Guaranteed Space . . . . . . . . . . : NO
Guaranteed Synchronous Write . . . . : NO
```

Note -- Space is really determined by the number of blocks and frequency of writes, this value is actually overridden by the LOGR policy

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SMS Constructs notes ......

```
STORAGE GROUP DEFINITION
------------------------
CDS Name . . . . . : ACTIVE
Storage Group Name : LOGGER          * SYS GROUP = sysplex minus systems in
Total Space for Storage Group          sysplex explicitly defined in SCDS
 MB-total:   32484
 MB-free :   25917   Available Group                    Available Group
 % Free  :   79     Space For Allocation              Space For Allocation
System/Sys SMS SG MB-      MB-      %     System/Sys SMS SG MB-      MB-
Group Name Status Total    Free     Free  Group Name Status Total    Free
---------- ------ ------- ------- ----  ---------- ------ ------- ------
*PELPLEXE  ENABLE  32484   25917   79  P09          ENABLE  32484   2591
P10        ENABLE  32484   25917   79

                                              Entries 1-12 of 12
Enter Line Operators below:                   Data Columns 3-8


        LINE       VOLUME  FREE      %     ALLOC    FRAG   LARGEST   FREE
        OPERATOR   SERIAL  SPACE    FREE   SPACE    INDEX  EXTENT    EXTENTS
       ---(1)----  -(2)--  --(3)--  (4)-   --(5)--  -(6)-  --(7)--   --(8)--
                   ILGR01 2728560    98    42940      2   2718378      2
                   ILGR02 2765912    99     5588      0   2765912      1
                   ILGR03 2753461    99    18039      0   2753240      2
                   ILGR04 2728560    98    42940      0   2728338      2
                   ILGR05 1459209    53  1312291      3   1451738      2
                   ILGR06 2741010    99    30490      0   2740789      2
                   ILGR07 2753461    99    18039      0   2753240      2
                   ILGR08 1484331    54  1287169      0   1484110      2
                   ILGR09 1471881    53  1299619      0   1471659      2
                   ILGR10 1434529    52  1336971      0   1434308      2
                   ILGR11 1471881    53  1299619     42   1274940      3
                   ILGR12 2741010    99    30490      0   2740789      2
```

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SMS Constructs notes .....

```
MANAGEMENT CLASS DEFINITION
---------------------------
CDS Name   . . . . . . . : ACTIVE
Management Class Name . : LOGPLEXE

Description  : SYSTEM LOGSTREAMS FOR PELPLEXE

Expiration Attributes                          Object Class Transition Criteria
   Expire after Days Non-usage  . : NOLIMIT       Time Since Creation Years  :
   Expire after Date/Days . . . . : NOLIMIT                           Months :
   Retention Limit  . . . . . . . : NOLIMIT                           Days . :

Partial Release . . . . . . . : NO                Time Since Last use Years  :
                                                                      Months :
Migration Attributes                                                  Days . :
   Primary Days Non-usage  . : NOLIMIT            Periodic
   Level 1 Days Date/Days  . : NOLIMIT               Monthly   on Day . . . . . :
                                                      Quarterly on Day . . . . . :
GDG Management Attributes                                       in Month . . . :
   # GDG Elements on Primary :                      Yearly    on Day . . . . . :
   Rolled-off GDS Action . . :                                 in Month . . . :

Backup Attributes                              AGGREGATE Backup Attributes:
   Backup frequency  . . . . . . . . . . . : 0
   Number of backup versions . . . . . . . :            # Versions  . . . . . . . :
      (Data Set Exists)                                 Retain only Version . . . :
   Number of backup versions . . . . . . . :              Unit  . . . . . . . . . :
      (Data Set Deleted)                              Retain extra Version  . . :
   Retain days only backup version . . . . :              Unit  . . . . . . . . :
      (Data Set Deleted)                              Copy Serialization  . . . :
   Retain days extra backup versions . . . :          ABackup Copy Technique  : STANDAR
   Admin or User Command Backup  . . . . . : NONE
   Auto Backup . . . . . . . . . . . . . . : NO
   Backup copy technique . . . . . . . . . : STANDARD
```

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- **For Coupling Facility logstreams**
  - **XCF, Logger and CFRM couple datasets**
- **For DASD only logstreams**
  - **XCF, and Logger couple datasets**
- **Defined via IXCL1DSU**
  - **Sample JCL in SYS1.SAMPLIB(IXCSYSPF)**
- **Recommendation is to define both a primary and alternate**
  - **eliminate single point of failure**

Transaction & Messaging Technical Conference

OS/390 Setup - Parmlib Members

- **LOADxx**
  - **IEASYM (xx,L)**
    - ➤ points to the IEASYMxx member in SYS1.PARMLIB to be used for system parameters and system symbols for all systems in a sysplex.
  - **SYSPARM (xx,L)**
    - ➤ points to the IEASYSxx member in SYS1.PARMLIB containing pointers to the couple dataset (via the COUPLE=xx parm) and sysplex configuration type (PLEXCFG)
  - **SYSPLEX name**
- **IEASYSxx parameters**
  - **contains parameters that control the initialization of an MVS system.**
  - **COUPLE=xx**
    - ➤ the COUPLExx member of SYS1.PARMLIB defines sysplex couple dataset name(s)
  - **SSN=xx**
    - ➤ the IEFSSNxx member in SYS1.PARMLIB for definitions for LOGR subsystem
      - ▪ SUBSYS SUBNAME(LOGR) INITRTN(IXGSSINT)
  - **PLEXCFG =**
    - ➤ XCFLOCAL - not in a sysplex (attempting to start the logger will result in error message IXG002E - RETCODE 00000008 RSNCODE 00000814)
      - ▪ sysplex couple dataset or sysplex timer is not available
    - ➤ MONOPLEX - single system sysplex
      - ▪ sysplex couple dataset is available, sysplex timer is optional
    - ➤ MULTISYSTEM - there are multiple systems in the sysplex
      - ▪ requires a sysplex timer and a sysplex couple dataset

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Sample SYS1.PARMLIB member excerpts

SYS1.PARMLIB(LOAD55)

```
IEASYM   55                  /* Use IEASYM55 for local variables */
IODF     00 SYS1     PLEX      P9
NUCLEUS  1
NUCLST   PB
PARMLIB  SYS1.PARMLIB
PARMLIB  USER.PARMLIB
SYSCAT   PBSM01113CICFCAT.PLEXB.MCAT
SYSPARM  55                  /* Use IEASYS55 */
```

SYS1.PARMLIB(IEASYM55)

```
/* IEASYM MEMBER – SETS LOCAL VARIABLES  */
/* SET DATASET LEVEL TO OS39028          */
SYSDEF SYSNAME(MV55)     /*SMF System ID */
SYMDEF(&SYSLEVEL.='OS39028')
```

SYS1.PARMLIB(IEASYS00)

```
.......
COUPLE=PB, /* Use COUPLEPB for Couple dataset information */
.......
GRS=STAR,        STAR MODE !!
.......
SSN=00,     /* Use IEFSSN00 for SUBSYSTEM names */
```

SYS1.PARMLIB(IEASYS55)

```
.......
OMVS=(55,T5),
.......
SYSNAME=MV55,
.......
```

SYS1.PARMLIB(COUPLEPB)

```
COUPLE SYSPLEX(PLEXB) /* Sysplex Couple Datasets */
       PCOUPLE(SYS1.SYSPLEXB.SEQ1.PCOUPLE,PBXCF1)
       ACOUPLE(SYS1.SYSPLEXB.SEQ1.ACOUPLE,PBXCF2)
       MAXMSG(1000)
       CTRACE(CTIXESPB)
DATA   TYPE(CFRM)    /* When CF logstreams are used */
       PCOUPLE(SYS1.SYSPLEXB.SEQ3.PCFRM,PBXCF1)
       ACOUPLE(SYS1.SYSPLEXB.SEQ3.ACFRM,PBXCF2)
DATA   TYPE(WLM)
       PCOUPLE(SYS1.SYSPLEXB.PWLM,PBXCF1)
       ACOUPLE(SYS1.SYSPLEXB.AWLM,PBXCF2)
DATA   TYPE(LOGR)    /* Logger couple datasets */
       PCOUPLE(SYS1.SYSPLEXB.SEQ1.PLOGR,PBXCF1)
       ACOUPLE(SYS1.SYSPLEXB.SEQ1.ALOGR,PBXCF2)
DATA   TYPE(ARM)
       PCOUPLE(SYS1.SYSPLEXB.SEQ1.PARM,PBXCF1)
       ACOUPLE(SYS1.SYSPLEXB.SEQ1.AARM,PBXCF2)
PATHOUT STRNAME(IXCDEF)
PATHIN  STRNAME(IXCDEF)
```

SYS1.PARMLIB(IEFSSN00)

```
........
SUBSYS SUBNAME(CICS)  /* CICS  */
   INITRTN(DFHSSIN)
   INITPARM(DFHSSI55)  /* message formatter parms */
SUBSYS SUBNAME(LOGR)  /* UPDATED 18/01/99 CPMA 621063 */
   INITRTN(IXGSSINT)
```

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Sample JCL - Couple Datasets

SYSPLEX Couple Datasets:
```
//INITPLEX  EXEC PGM=IXCL1DSU
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ1.PCOUPLE) VOLSER(PBXCF1)
        CATALOG
      DATA TYPE(SYSPLEX)
        ITEM NAME(GROUP) NUMBER(60)
        ITEM NAME(MEMBER) NUMBER(200)
        ITEM NAME(GRS) NUMBER(1)
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ1.ACOUPLE) VOLSER(PBXCF2)
        CATALOG
      DATA TYPE(SYSPLEX)
        ITEM NAME(GROUP) NUMBER(60)
        ITEM NAME(MEMBER) NUMBER(200)
        ITEM NAME(GRS) NUMBER(1)
```

CFRM Couple Datasets:
```
//INITCFRM  EXEC PGM=IXCL1DSU
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ3.PCFRM) VOLSER(PBXCF1)
        CATALOG
      DATA TYPE(CFRM)
        ITEM NAME(POLICY) NUMBER(5)
        ITEM NAME(CF) NUMBER(5)
        ITEM NAME(STR) NUMBER(128)
        ITEM NAME(CONNECT) NUMBER(32)
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ3.ACFRM) VOLSER(PBXCF2)
        CATALOG
      DATA TYPE(CFRM)
        ITEM NAME(POLICY) NUMBER(5)
        ITEM NAME(CF) NUMBER(5)
        ITEM NAME(STR) NUMBER(128)
        ITEM NAME(CONNECT) NUMBER(32)
```

Logger Couple datasets:
```
//INITLOGR  EXEC PGM=IXCL1DSU
//STEPLIB  DD DISP=SHR,DSN=SYS1.MIGLIB
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ1.PLOGR) VOLSER(PBXCF1)
        CATALOG
      DATA TYPE(LOGR)
        ITEM NAME(LSR) NUMBER(4000)
        ITEM NAME(LSTRR) NUMBER(50)
        ITEM NAME(DSEXTENT) NUMBER(100)
   DEFINEDS SYSPLEX(PLEXB)
        DSN(SYS1.SYSPLEXB.SEQ1.ALOGR) VOLSER(PBXCF2)
        CATALOG
      DATA TYPE(LOGR)
        ITEM NAME(LSR) NUMBER(4000)
        ITEM NAME(LSTRR) NUMBER(50)
        ITEM NAME(DSEXTENT) NUMBER(100)
```

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Gathering Doc. --- SLIP Trap

The following SLIP may be used in cases where information is required from both CICS and the MVS logger for problem resolution. The sample SLIP provided is such that it will just fit in the extended operator command area on MVS V5. The xx,yy,zz values must be replaced with the appropriate operator reply numbers as each segment is entered.

In the example, the SLIP will trigger when a DFHRM04xx message is written to the console.
Key information is REQUIRED in order to capture all the data. Replace cicsjob with the name(s) of the CICS JOBs to be dumped. The other key piece of information is the structure name which contains the logstream. The name is obtained by running the IXCMIAPU utility.

In the example, the CICS region is IYOT2 with a logstream name of GRAUEL.IYOT2.DFHLOG. In the IXCMIAPU output, search for the logstream name and the structure name is listed. This is the structure name which must be provided in the SLIP.

Most CICS logger problems are not intermittent (there will always be exceptions) and so once the problem is encountered, it will be possible to run the utility and set the SLIP with the correct information.

```
********************************************************
```

To change the SLIP to trigger on a DFHLG077x message alter the second line of the SLIP to
+4,EQ,C4C6C8D3,+8,EQ,C7F0F7F7),A=SVCD,JOBLI   <change the message
```
********************************************************
```

For all logger problems the logstreams should be printed using DFHJUP, and the offload datasets should saved (IDCAMS REPRO).
```
********************************************************
```

```
SLIP SET,IF,LPAMOD=(IGC0003E,0),DATA=(1R?
+4,EQ,C4C6C8D9,+8,EQ,D4F0F4),A=SVCD,JOBLI   <change the message
ST=(cicsjob,IXGLOGR,XCFAS),              <change the CICS Job Name

xx,DSPNAME=('XCFAS'.*,'IXGLOGR'.*),STRLIS
T=(STRNAME=LOG_SYSTEST_001,LOCKENTRIEs,AC   <change the structure name
C=NOLIM,(LISTNUM=ALL,

yy,ENTRYDATA=SERIALIZE,ADJUNCT=CAPTURE)),
SDATA=(RGN,XESDATA,ALLNUC,CSA,LSQA,PSA,SQ
SWA,TRT,COUPLE,WLM,GRSQ,LPA),

zz,ID=LOGR,REMOTE=(JOBLIST,DSPNAME,SDATA),END
```

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Time for an OFFLOAD

To activate CTRACE for the logger component:

TRACE CT,5M,COMP=SYSLOGR   **-- allocate 5M of buffers for the logger CTRACE**
R xx,OPTIONS=(ALL),END

The buffers will be contained in a dump of the logger and it's address space.
Format the trace using IPCS   IPCS CTRACE COMP(SYSLOGR)
Refer to OS/390 MVS Diagnosis: Tools and Service Aids

Sample output (edited):

```
MVSB        CONNECT     04190004    10:12:45.060080    IXGF1IWO ENTRY
MVSB        CONNECT     04190005    10:12:45.060107    IXGF1IWO EXIT
MVSB        LOGSTRM     04160010    10:12:45.065329    WOW ENTRY
MVSB        LOGSTRM     04160011    10:12:45.067087    WOW START
MVSB        LOGSTRM     04160014    10:12:45.254011    WOW UPDATE OCNTL
MVSB        LOGSTRM     04160013    10:12:45.258315    WOW UPDATE PCNTL
MVSB        LOGSTRM     04160012    10:12:45.258695    WOW EXIT
-----
MVSB        CONNECT     04190004    10:12:44.099483    IXGF1IWO ENTRY
MVSB        CONNECT     04190005    10:12:44.099513    IXGF1IWO EXIT
MVSB        LOGSTRM     04160010    10:12:44.105150    WOW ENTRY
MVSB        LOGSTRM     04160011    10:12:44.106882    WOW START
MVSB        LOGSTRM     04160014    10:12:44.287855    WOW UPDATE OCNTL
MVSB        LOGSTRM     04160013    10:12:44.291762    WOW UPDATE PCNTL
MVSB        LOGSTRM     04160012    10:12:44.292174    WOW EXIT
-----
```

.198615 seconds

.192691 seconds

In this example, the offload was for a 50M structure

.

DFHJUP JCL to print logstream

```
DFHJUP is a CICS provided utility used to print and copy CICS logstreams.
Data which has been deleted is not listed.



//JUP        JOB (WINVMC,GRAUEL),'JIM GRAUEL',
//              USER=GRAUEL,CLASS=M
/*JOBPARM SYSAFF=MV55
//*ROUTE PRINT WINVMC.GRAUEL
//*
//* -------------------------------------------------------------------
//* RUN DFHJUP (JOURNAL UTILITY PROGRAM).
//*     PRINT REDO RECORDS
//* -------------------------------------------------------------------
//DFHJUP   EXEC PGM=DFHJUP
//STEPLIB  DD  DISP=SHR,DSN=GRAUEL.CICSTS13.CICS.SDFHLOAD
//SYSPRINT DD  SYSOUT=*,RECFM=FBA
//SYSUT1   DD  DSN=IYOT1.DFHLOG,DISP=SHR,
//             DCB=BLKSIZE=32760,
//           SUBSYS=(LOGR,DFHLGCNV)
//SYSIN    DD  *
OPTION PRINT
END
//*
```

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DFHJUP JCL to print logstream...

```
DFHJUP - JOURNAL PRINT UTILITY PROGRAM


Block identifier - 00000000027D07EF
Length of block  -         00000074


GMT timestamp    - B5B167B8EE10EC00      04/16/2001 02:27:44.186638
Local timestamp  - B5B175222850EC00      04/16/2001 03:27:44.186638


This block was read from the log stream active area

 000000    000000    6EC4C6C8 01400001  C9E8D6E3 F1404040   B5B167B5 D9D51003  B5B1751F 14141003  *>DFH. ..IYOT1   ....RN....*
 000020              00000000 00000001  00000000 00000000   00000074                             *.................   *
 000000    000034    00000040 00000010  B5B167C8 ECA03303   00000000 00000000  00000000 00000000  *... .......H.....*
 000020              00000004 001C7AC5  E7D3C700 40404040   40404040 40404040  40404040 00000000  *......:EXLG.      ..*


Block identifier - 00000000027D088B
Length of block  -         00000525


GMT timestamp    - B5B167C62B248C07      04/16/2001 02:27:58.068296
Local timestamp  - B5B1752F65648C07      04/16/2001 03:27:58.068296


This block was read from the log stream active area

 000000    000000    6EC4C6C8 01400001  C9E8D6E3 F1404040   B5B167C6 2AFC8C07  B5B1752F 653B8C07  *>DFH. ..IYOT1   ...F......*
 000020              00000000 00000002  00000000 027D07EF   00000525                             *.............'......    *
 000000    000034    00000419 00000010  B5B167D9 3DB0C207   00000000 027D07EF  01010000 00000034  *...........R..B......'....*
 000020              00000001 00000000  00000000 00000000   00000000 001CE0D9  D4E4E600 40404040  *.................RMUW.   *
 000040              40404040 40404040  C3C1E3C1 0000026C   0054E0C1 D7D9C4B5  B167D932 315D0804  *        CATA...%APRD...R..*
 000060              20404040 40404040  40404040 40000002   6CC3C1E3 C1C7D9C1  E4C5D340 40404040  *.        ...%CATAGRAUEL    *
 000080              170EC7C2 C9C2D4C9  E8C14BC9 E8D6E3F1   B167D932 315D0001  00000000 00000000  *..GBIBMIYA.IYOT1..R..)....*
 0000A0              00000080 000D7AC1  D7D9C401 A00002E3   C2036600 08D7F1F4  F5F0F0F2 400008C9  *.:APRD....TB...P145002 ..I*
 0000C0              E8D6F1E3 C3F0F203  4EE3E940 0240E3C3   F0F291F2 00040F14  1B440000 00000000  *YO1TC02.+TZ . TC02J2......*
 0000E0              00000000 00000000  00000000 00000000   00000C40 4040C5D5  E4000000 01000000  *............. ENU.......*
 000100              00144040 40404040  40400000 00000000   00000000 00000780  18500000 0000FAE1  *..       .........&.....*
 000120              A0000240 00000000  00000E3C 3DB00000   00000800 000000A0  00010F14 9AE00000  *... .....................*
 000140              00000000 00000E3C  22A00000 00000000   00000000 00000000  00000000 00000E3B  *.........................*
 000160              D0000000 00008100  00000000 00000000   00000000 00000000  00000084 00000000  *......A..............D....*
 000180              00000000 00000000  00000000 00000000   00008000 00000000  000000C0 00000000  *.........................*
```

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ADRDSSU JCL to dump a log dataset

An alternative to using DFHJUP to print a logstream is to use the ADRDSSU utility to print the log (offload) datasets.
ADRDSSU can be used to print a single log dataset, where DFHJUP will print the entire logstream. ADRDSSU will print all
data in the log dataset even though it may have been deleted from a CICS and MVS logger perspective. However, ADRDSSU
does not format the blocks like DFHJUP, making it more difficult to read.

```
DSLIST - Data Sets Matching GRAUEL.IYOT1.DFHLOG                    Row 1 of 5

Command - Enter "/" to select action                   Message        Volume
-------------------------------------------------------------------------------
        GRAUEL.IYOT1.DFHLOG.A0000005                                 MIGRAT2
        GRAUEL.IYOT1.DFHLOG.A0000005.DATA                            MIGRAT2
        GRAUEL.IYOT1.DFHLOG.A0000010                                 *VSAM*
        GRAUEL.IYOT1.DFHLOG.A0000010.DATA                            PBDA22
        GRAUEL.IYOT1.DFHLOG.COPY2                                    MIGRAT2
**************************** End of Data Set list ****************************
```

```
//ADRDSSU2 JOB (WINVMC,GRAUEL),'JIM GRAUEL',
//             USER=GRAUEL,CLASS=M
/*JOBPARM SYSAFF=MV55
//****************************************************************
//*TO DUMP THE LOGR OFFLOAD DATA SETS, USE THE ADRDSSU UTILITY IN THE
//* FOLLOWING JCL:
//****************************************************************
//STEP1    EXEC PGM=ADRDSSU,REGION=4M                          0000000
//SYSPRINT DD   SYSOUT=*                                       0000000
//SYSIN    DD   *                                              0000000
    PRINT INDYNAM(PBDA22) -                                    0000000
        DS(GRAUEL.IYOT1.DFHLOG.A0000010.DATA)                 0000000
/*                                                             0000000
```

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ADRDSSU JCL to dump a log dataset....

```
PAGE 0001      5695-DF175  DFSMSDSS V1R5.0   DATA SET SERVICES       2001.106 16:47
       PRINT INDYNAM(PBDA22) -                                        0000000
           DS(GRAUEL.IYOT1.DFHLOG.A0000010.DATA)                      0000000
ADR101I (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'PRINT '
ADR109I (R/I)-RI01 (01), 2001.106 16:47:10 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED.
ADR016I (001)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR006I (001)-STEND(01), 2001.106 16:47:10 EXECUTION BEGINS
*** TRACK(CCHH)  00600000         R0 DATA  0060000000000000
    COUNT  0060000001001000
 0000   00000000 027CFF3D B5B16429 7A8D5708   B5B17192 B4CD5708 0000009E 000000C6   *.....@......:.....k...........F*
 0020   01000000 6EC4C6C8 01400001 C9E8D6E3   F1404040 B5B16429 7A84CA08 B5B17192   *....>DFH....IYOT1........:d.....k*
 0040   B4C3CA08 00000000 0000467F 00000000   027CFDFB 0000009E 0000006A 00000010   *.C........."....@.........¦....*
 0060   B5B1643C 8D527108 00000000 027CFDFB   01010000 00000034 00000001 00000000   *.............@.................*
 0080   027CFDFB 01010000 00000034 001CE0D9   D4E4E600 E3C3F0F3 C9E8C5E3 E3C3F0F3   *.@.............RMUW.TC03IYETTC03*
 00A0   D1D6E4D9 0000041C 001A7AE2 E3C1E3B5   B164378E 85970601 00B5B164 3C8D5154   *JOUR.......:STAT.....ep..........*
 00C0   08800000 00C60000 0000027D 0003B5B1   6500C4A1 E603B5B1 7269FEE1 E6030000   *.....F.....'......D~W........W...*
 00E0   07240000 074C0100 00006EC4 C6C80140   0001C9E8 D6E3F140 4040B5B1 6500C457   *.....<....>DFH....IYOT1.......D.*
 0100   F003B5B1 7269FE96 F0030000 00000000   46800000 0000027C FF3D0000 07240000   *0......o0...............@........*
 0120   00500000 0010B5B1 65139BAB FF090000   0000027C FF3D0101 00000000 00340000   *.&.................@............*
 0140   00010000 00000000 00000000 00000000   0000001C 7AD2C5E8 D7C04040 40404040   *....................:KEYP{......*
 0160   40404040 40404040 40400000 00000000   01230000 0010B5B1 6513D522 E7000000   *..........................N.X...*
 0180   00000000 46800001 00000000 00340000   00010000 00000000 46800001 00000000   *................................*
 01A0   0034001C E0D9D4D9 D6804040 40404040   40404040 4040C3E2 E7D40000 049C000B   *.....RMRO............CSXM......*
 01C0   7AC1D7C9 C3010000 0000C86E C4C6C8C1   D7C9C3C5 40404040 400F07A3 E8000000   *:APIC.....H>DFHAPICE.......tY...*
 01E0   00000000 00C3E6C2 C706C7D9 C1E4C5D3   40404040 00004001 00003B24 2BC4C6C8   *.....CWBG.GRAUEL.............DFH*
 0200   C3E6C2C7 40000000 00000000 00000000   00000000 00000040 00000000 00000000   *CWBG............................*
 0220   00C9E8D6 E3F14040 40000000 06C7D9C1   E4C5D340 40404000 07E3E2D6 E4E2C5D9   *.IYOT1.......GRAUEL......TSOUSER*
 0240   40404000 00000000 00000000 00000000   00B5B169 7E54BCA4 05000000 00000000   *.................=..u..........*
 0260   00B5B15C 151A79ED 05000000 00000000   00000000 00000000 00000000 00000000   *...*..........................*
 0280   00000000 00000000 00000000 00000000   00000001 23000000 10B5B165 13D525DF   *.............................N..*
 02A0   00000000 00000046 80000100 00000000   84000000 01000000 00000046 80000100   *................d...............*
 02C0   00000000 84001CE0 D9D4D9D6 80404040   40404040 40404040 40C3E2E7 D4000004   *....d...RMRO.............CSXM...*
 02E0   9C000B7A C1D7C9C3 01000000 00C86EC4   C6C8C1D7 C9C3C540 40404040 0F07A190   *...:APIC.....H>DFHAPICE.......~.*
 0300   00000000 00000000 C3D9E2D8 06C7D9C1   E4C5D340 40404000 00400108 00AE7F53   *........CRSQ.GRAUEL...........".*
 0320   C4C6F0F0 F0F0F0F5 00000000 00000000   00000000 00000000 00004000 00000000   *DF000005......................*
 0340   00000000 C9E8D6E3 F1404040 00000006   C7D9C1E4 C5D34040 40400007 E3E2D6E4   *....IYOT1.......GRAUEL......TSOU*
```

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Dumping the LOGR Couple datasets

Once in a great while it is necessary to dump the contents of the LOGR couple dataset for problem diagnosis. The preferred utility to perform this function is ADRDSSU. Use the *D XCF,COUPLE,TYPE=LOGR* display to obtain the dataset name and volume where the couple dataset resides.

```
D XCF,COUPLE,TYPE=LOGR
RESPONSE=MV55
 IXC358I  16.11.18  DISPLAY XCF 798
 LOGR COUPLE DATA SETS
 PRIMARY    DSN: SYS1.SYSPLEXB.SEQ1.PLOGR
            VOLSER: PBXCF1      DEVN: 6B1E
            FORMAT TOD          MAXSYSTEM
            01/03/2001 15:57:24         8
            ADDITIONAL INFORMATION:
             LOGR COUPLE DATA SET FORMAT LEVEL: HBB6603
             LSR(4000) LSTRR(50) DSEXTENT(100)
 ALTERNATE  DSN: SYS1.SYSPLEXB.SEQ1.ALOGR
            VOLSER: PBXCF2      DEVN: 6B15
            FORMAT TOD          MAXSYSTEM
            01/03/2001 15:58:17         8
            ADDITIONAL INFORMATION:
             LOGR COUPLE DATA SET FORMAT LEVEL: HBB6603
             LSR(4000) LSTRR(50) DSEXTENT(100)


 LOGR IN USE BY ALL SYSTEMS


//ADRDSSU  JOB (WINVMC,GRAUEL),'JIM GRAUEL',USER=GRAUEL,CLASS=M
/*JOBPARM SYSAFF=MV55
//******************************************************************  0000000
//* USE THE D XCF,COUPLE,TYPE=LOGR  TO OBTAIN THE DSN AND VOLSER    *
//*                                                                 *
//* THE FOLLOWING JCL IS AN EXAMPLE OF DUMPING THE LOGR COUPLE      *
//* DATA SET USING THE ADRDSSU UTILITY                             *
//******************************************************************
//STEP1     EXEC PGM=ADRDSSU,REGION=4M                               0000000
//SYSPRINT DD    SYSOUT=*                                            0000000
//DD1       DD    DISP=SHR,VOL=SER=PBXCF1,UNIT=3390                  0000000
//SYSIN     DD    *                                                  0000000
    PRINT DATASET(SYS1.SYSPLEXB.SEQ1.PLOGR) INDDNAME(DD1) TOL(ENQF)
/*                                                                   0000000
```

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Dumping the LOGR Couple datasets...

```
PAGE 0001      5695-DF175  DFSMSDSS V1R5.0  DATA SET SERVICES      2001.106 16:15
     PRINT DATASET(SYS1.SYSPLEXB.SEQ1.PLOGR) INDDNAME(DD1) TOL(ENQF)
ADR101I (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'PRINT '
ADR109I (R/I)-RI01 (01), 2001.106 16:15:31 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED.
ADR016I (001)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR006I (001)-STEND(01), 2001.106 16:15:31 EXECUTION BEGINS
ADR411W (001)-DYNA (01), DATA SET SYS1.SYSPLEXB.SEQ1.PLOGR ON VOLUME PBXCF1 WAS NOT SERIALIZED ON REQUEST
*** TRACK(CCHH)  018F000C         R0 DATA  0000000000000000
    COUNT  018F000C010000E2
 0000  E2C4D941 D7D3C5E7 C2404040 00010001  018F000C 02A70004 00000000 00000000  *SDR.PLEXB............x...........*
 0020  00000000 00000000 0000B530 8F42100E  9708000F 00010039 00080009 00010004  *...............p................*
 0040  03600000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *.-..............................*
 0060  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*
 0080  TO  00DF   SAME AS ABOVE
 00E0  0000                                                                       *..                              *
    COUNT  018F000C02200010                               ALL KEY/DATA 00
    COUNT  018F000C03100028                               ALL KEY/DATA 00
    COUNT  018F000C04000360
 0000  D3C9D5E5 D7404040 D3E2C9D9 40404040  00010009 00030000 105F0003 0001E800  *LINVP...LSIR..............¬....Y.*
 0020  00000000 00010003 00010002 DA70BC20  00000002 C9E7C7C9 D5E54040 00020001  *....................IXGINV......*
 0040  00020002 C6000FA0 00000FA0 00000000  00000000 00030003 00500000 00000000  *....F......................&.....*
 0060  D3C9D5E5 D7404040 D3E2E3D9 C9D94040  00010009 00030000 105F0001 0001E800  *LINVP...LSTRIR............¬....Y.*
 0080  00000000 00040004 00010002 07D007D0  00000002 C9E7C7C9 D5E54040 00020001  *.............}.}....IXGINV......*
 00A0  00020002 C6000032 00000032 00000000  00000000 00030003 00500000 00000000  *....F......................&.....*
 00C0  D3C9D5E5 D7404040 D3E2E8E2 C9D94040  00010009 00030000 105F0001 0001E800  *LINVP...LSYSIR............¬....Y.*
 00E0  00000000 00050005 00010002 05000500  00000002 C9E7C7C9 D5E54040 00020001  *....................IXGINV......*
 0100  00020002 C6000020 00000020 00000000  00000000 00030003 00500000 00000000  *....F......................&.....*
 0120  D3C9D5E5 D7404040 D3E2D940 40404040  00010009 00030000 105F0001 0001E800  *LINVP...LSR..............¬....Y.*
 0140  0F9F0000 00060006 00010002 26782678  00000002 C9E7C7C9 D5E54040 00020001  *....................IXGINV......*
 0160  00020002 00000000 00000000 00000000  00000000 00030003 00500000 00000000  *..........................&.....*
```

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APAR OW27153 describes the command and messages:

Displaying the System Logger and its Log Streams

Use the DISPLAY LOGGER command to display the status of the system logger, individual log streams, or log streams from a sysplex view.

Note: You can use a wildcard character with the DISPLAY LOGGER command. You can modify the DISPLAY output by specifying an asterisk (*) as the search argument, or by specifying an asterisk as the last character of a larger search argument. If used, a wildcard must be the last character in a search argument, or the only character.

Restrictions

* Do not use the same parameter twice within a single command.

* Do not exceed a command line length of 128 characters.

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Syntax

```
------------------------------------------------------------------------
D LOGGER

[  {,STatus                           }

   {,Connection
        [ {,LSName=logstreamname
           [,Jobname=jobname]
           [,Summ|Detail]              }
          {,Jobname=jobname
           [,LSName=logstreamname]
           [,Summ|Detail]             }
          {,SYSPLEX[,LSName=logstreamname]}
          {,DASDONLY}                          ] }

   {,Logstream
        [ {[,LSName=logstreamname]
           [,STRName=structurename] }
          {[,LSName=logstreamname]
           [,DASDONLY]                }          ] }


   {,STRucture[,STRName=structurename]}        ]
```

The parameters are:

STATUS or ST
 Display the current operational status of the system
 logger. STATUS is the default for the Display LOGGER
 command if no parameters are specified. Possible status
 values are:

NOT AVAILABLE FOR IPL   Due to XCF local mode, the
 system logger will not be available for
 the life of this IPL.

INITIALIZING   The system logger is in the process
 of initializing.
ACTIVE   The system logger is up and running.
NOT ACTIVE   The system logger has terminated.

CONNECTION or CONN or C
 Display all log streams with one or more connections
 for the system(s) on which the command was issued.
 However, if the SYSPLEX filter is used, change the
 view of the output to the systems/resources that are
 connected to the log stream (a sysplex view).

LSNAME or LSN = logstreamname
 This filter requests a display of all actively
 connected log streams matching the specified
 logstream name.

JOBNAME or JOB or J = mvsjobname
 This filter requests a display of all log streams with
 one or more connections to which the specified jobname
 is connected.

SUMM or S, or DETAIL or D
 These two parameters are valid only when LSNAME or
 JOBNAME is specified as part of the CONNECTION display.
 SUMM (summary) is the default if not specified, and
 will display a condensed overview of information
 pertinent to the command that was invoked. DETAIL will
 result in a more detailed report.

SYSPLEX
 This filter requests to change the view of the output
 for the display logger command CONNECTION option from
 a system view to a sysplex view showing systems and
 resources connected to a log stream. The display will
 show all log streams with one or more connections on
 the sysplex.

 Note: You may use the LSNAME|LSN filter to narrow the
 information to search for and display.

DASDONLY
 This filter requests a display of all log streams
 with a DASDONLY configuration.

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OW27153 -- Display Logger command ....

LOGSTREAM or L
Display log stream sysplex information.

LSNAME or LSN = logstreamname
This filter requests a display of all defined log streams matching the specified log stream name.

STRNAME or STRN = structurename
This filter displays all log streams on the sysplex which are defined to a structure that matches the specified structure name.

DASDONLY
This filter requests a display of all log streams matching other filters with a DASDONLY configuration.

STRUCTURE or STR
Sort by structure name and display all log streams defined to a structure on a sysplex.

STRNAME or STRN = structurename
This filter requests a sort by structure and display of all defined log streams on the sysplex matching the specified structure name.

Example 1:
Display the current operational status of the System Logger.
DISPLAY LOGGER,STATUS

Example 2:
Display all log streams with one or more connections for the system that match the log stream name starting with the letters "LOGSTR".
DISPLAY LOGGER,CONN,LSN=LOGSTR*

Example 3:
Display all log streams with at least one active connection in the sysplex that matches the log stream name starting with the letters "LOGSTR".
DISPLAY LOGGER,CONN,SYSPLEX,LSN=LOGSTR*

Example 4:
Display all defined log streams for the sysplex that match the log stream name of "LOGA" and have associated structure names that start with "LIST".
DISPLAY LOGGER,L,LSN=LOGA,STRN=LIST*

Example 5:
Display all defined log streams for the sysplex that start with "LOGSTR" and have a DASD-only configuration.
DISPLAY LOGGER,L,LSN=LOGSTR*,DASDONLY

Example 6:
Display all defined log streams for the sysplex and sort by structure name starting with the letters "LIST".
DISPLAY LOGGER,STR,STRN=LIST*

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Display Logger command

d logger
d logger,status

d logger,connection
d logger,connection,lsn=*
d logger,connection,lsn=*,s
d logger,connection,lsn=*,d
d logger,connection,job=*
d logger,connection,job=*,s
d logger,connection,job=*,d
d logger,connection,lsn=*,job=*
d logger,connection,lsn=*,job=*,s
d logger,connection,lsn=*,job=*,d
d logger,connection,job=*,lsn=*
d logger,connection,job=*,lsn=*,s
d logger,connection,job=*,lsn=*,d
d logger,connection,sysplex
d logger,connection,sysplex,lsn=*
d logger,connection,dasdonly

d logger,logstream
d logger,logstream,lsn=*

d logger,logstream,strn=*
d logger,logstream,lsn=*,strn=*

d logger,logstream,strn=*,lsn=*
d logger,logstream,dasdonly
d logger,logstream,dasdonly,lsn=*
d logger,logstream,lsn=*,dasdonly

d logger,structure
d logger,structure,strn=*

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Display Logger,LOGSTREAM

```
MV2C    98327 04:09:52.23 GRAUEL    00000280   D LOGGER,LOGSTREAM

MV2C    98327 04:09:58.32 GRAUEL    00000080   IXG601I   04.09.52  LOGGER DISPLAY 802
                              802 00000080   INVENTORY INFORMATION BY LOGSTREAM
                              802 00000080   LOGSTREAM                   STRUCTURE       #CONN  STATUS
                              802 00000080   ---------                   ---------       ------ ------
                              802 00000080   ABRODIE.IYK3ZFZ1.DFHLOG     *DASDONLY*      000000 AVAILABLE
                              802 00000080   ABRODIE.IYK3ZFZ1.DFHSHUNT   *DASDONLY*      000000 AVAILABLE

                              802 00000080   GRAUEL.IYOT1.DFHLOG         *DASDONLY*      000001 IN USE
                              802 00000080      SYSNAME: MV2C
                              802 00000080        STG DS: YES
                              802 00000080   GRAUEL.IYOT1.DFHSHUNT       *DASDONLY*      000001 IN USE
                              802 00000080      SYSNAME: MV2C
                              802 00000080        STG DS: YES
                              802 00000080   TROUT.LG000.DFHLOG          LOG_SYSTEST_001 000001 IN USE
                              802 00000080      SYSNAME: MV26
                              802 00000080        STG DS: NO
                              802 00000080   TROUT.LG000.DFHSHUNT        LOG_SYSTEST_002 000001 IN USE
                              802 00000080      SYSNAME: MV26
                              802 00000080        STG DS: NO

MV2C    98328 02:57:41.25 GRAUEL    00000280   D LOGGER,LOGSTREAM,LSN=GRAUEL.IYOT1.DFHLOG

MV2C    98328 02:57:41.47 GRAUEL    00000080   IXG601I   02.57.41  LOGGER DISPLAY 294
                              294 00000080   INVENTORY INFORMATION BY LOGSTREAM
                              294 00000080   LOGSTREAM                   STRUCTURE       #CONN  STATUS
                              294 00000080   ---------                   ---------       ------ ------
                              294 00000080   GRAUEL.IYOT1.DFHLOG         *DASDONLY*      000001 IN USE
                              294 00000080      SYSNAME: MV2C
                              294 00000080        STG DS: YES
```

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Display Logger,STRUCTURE

```
MV2C        98328 03:11:11.92 GRAUEL    00000280  D LOGGER,STRUCTURE
MV2C        98328 03:11:17.78 GRAUEL    00000080  IXG601I    03.11.11   LOGGER DISPLAY 392
                                    392 00000080  INVENTORY INFORMATION BY STRUCTURE
                                    392 00000080  STRUCTURE                              CONNECTED
                                    392 00000080  ---------                              ---------
                                    392 00000080  LOG_CHNGTEAM_001
                                    392 00000080    *NO LOGSTREAMS DEFINED*                 N/A
                                    392 00000080  LOG_DEVELOP_001
                                    392 00000080    *NO LOGSTREAMS DEFINED*                 N/A

                                    392 00000080  LOG_GENERAL_001
                                    392 00000080    BUXTON.IYK2ZET1.DFHLOG                  NO
                                    392 00000080    BUXTON.IYK2ZET1.DFHSHUNT                NO
                                    392 00000080    FVDATAA.IYK3Z7AA.DFHLOG                 NO
                                    392 00000080    FVDATAA.IYK3Z7AA.DFHSHUNT               NO
                                    392 00000080    ABULL.IYK2ZFX2.BAMAUDIT                 NO
                                    392 00000080  LOG_GENERAL_002


MV2C        98328 02:48:36.95 GRAUEL    00000280  D LOGGER,STRUCTURE,STRN=LOG_SYSTEST_001

MV2C        98328 02:48:42.53 GRAUEL    00000080  IXG601I    02.48.36   LOGGER DISPLAY 034
                                    034 00000080  INVENTORY INFORMATION BY STRUCTURE
                                    034 00000080  STRUCTURE                              CONNECTED
                                    034 00000080  ---------                              ---------
                                    034 00000080  LOG_SYSTEST_001
                                    034 00000080    TROUT.LG000.DFHLOG                     NO
                                    034 00000080    TROUT.LG004.DFHLOG                     NO
                                    034 00000080    TROUT.LG008.DFHLOG                     NO
                                    034 00000080    TROUT.LGAC1.DFHLOG                     YES
                                    034 00000080    CTS.CTSCICS.LOG                        NO
                                    034 00000080    CTS.V130.IYCQCTSS.DFHJ01               NO
                                    034 00000080    CTS.V130.IYCSCTSS.DFHJ01               NO
```

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Display Logger,CONNECTION

```
MV2C       98328 03:25:01.57 GRAUEL      00000280   D LOGGER,CONNECTION

MV2C       98328 03:25:01.60 GRAUEL      00000080   IXG601I   03.25.01  LOGGER DISPLAY 962
                              962 00000080   CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM MV2C
                              962 00000080   LOGSTREAM                    STRUCTURE         #CONN  STATUS
                              962 00000080   ---------                    ---------         ------ ------
                              962 00000080   ATR.PLEX2.RM.DATA            LOG_RRS_TEST      000001 IN USE
                              962 00000080   ATR.PLEX2.MAIN.UR            LOG_RRS_TEST      000001 IN USE
                              962 00000080   ATR.PLEX2.DELAYED.UR         LOG_RRS_TEST      000001 IN USE
                              962 00000080   ATR.PLEX2.RESTART            LOG_RRS_TEST      000001 IN USE
                              962 00000080   ATR.PLEX2.ARCHIVE            LOG_RRS_TEST      000001 IN USE
                              962 00000080   GRAUEL.IYOT1.DFHLOG          *DASDONLY*        000001 IN USE
                              962 00000080   GRAUEL.IYOT1.DFHSHUNT        *DASDONLY*        000001 IN USE

MV2C       98328 03:32:22.28 GRAUEL      00000280   D LOGGER,CONNECTION,LSN=GRAUEL.IYOT1.DFHLOG,S

MV2C       98328 03:32:22.31 GRAUEL      00000080   IXG601I   03.32.22  LOGGER DISPLAY 927
                              927 00000080   CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM MV2C
                              927 00000080   LOGSTREAM                    STRUCTURE         #CONN  STATUS
                              927 00000080   ---------                    ---------         ------ ------
                              927 00000080   GRAUEL.IYOT1.DFHLOG          *DASDONLY*        000001 IN USE

MV2C       98328 03:42:43.12 GRAUEL      00000280   D LOGGER,CONNECTION,LSN=GRAUEL.IYOT1.DFHLOG,D

MV2C       98328 03:42:43.16 GRAUEL      00000080   IXG601I   03.42.43  LOGGER DISPLAY 928
                              928 00000080   CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM MV2C
                              928 00000080   LOGSTREAM                    STRUCTURE         #CONN  STATUS
                              928 00000080   ---------                    ---------         ------ ------
                              928 00000080   GRAUEL.IYOT1.DFHLOG          *DASDONLY*        000001 IN USE
                              928 00000080   STG DS: YES
                              928 00000080       JOBNAME: IYOT1     ASID: 0056
                              928 00000080        R/W CONN: 000000 / 000001
                              928 00000080        RES MGR./CONNECTED: *NONE*    / NO
                              928 00000080        IMPORT CONNECT: NO
```

Transaction & Messaging Technical Conference