z/OS Documentation Updates for APARs OA57833, OA58134, and OA59581 (Media Manager Dual Logging)

Table of Contents

Updates to z/OS DFSMSdfp Advanced Services (SC23-6861-40)

z/OS DFSMSdfp Advanced Services is updated with OA58134.

Table 98. DFA Fields

DFAMMDUALLOG is defined within DFAFEAT11 as follows:

Offset	Type/Value	Length	Name	Description
...	...	...	...	...
82 (52)	Bit string	1	DFAFEAT11	Features byte 11
	1...		DFASEQENCRYPT	Basic and large ds enc
	.1..		DFACatalogInfoValid	Catalog fields DFACATINFO and DFACatAliasLvl below are valid.
	..1.		DFAMMDUALLOG	Media Manager Dual Log Support
	...1 1111			Reserved
...	...	...	...	...

Updates to z/OS DFSMSdfp Diagnosis (SC23-6863-40)

z/OS DFSMSdfp Diagnosis is updated with OA57833.

Chapter 12 was updated to add the following new Media Manager return codes:

ss	*cccc*	*ff*	Error Description
...	...	...	...
04	0105	--	Related error. This error may be set in response to a MMCALL dual logging request in an MMRELIST array entry in the field MMRELIST_RETCODE. This return code indicates that processing for the associated data set has been terminated due to a more severe error associated with the “other data set”.
...	...	...	...
0C	000C	06	An error was detected with one of the MMIBs specified. • MMIB eyecatcher is incorrect • The same MMIB is passed for both entries in the MMIBLIST • MMIB attributes of the two MMIBs do not match
	...	...	...
	0010	0C	Invalid return code from user exit. A return code of 8 from a user die exit is not supported when a MMIBLIST is specified.
	...	...	...
	0105	--	Error used only with dual logging. Used in setting MMREL_RETCODE(x). Indicates that there was an error in processing “the other” data set, and IO to this data set may not have been completed.
	0118	--	MMCALL OP=REMOVESYNCIOWRITEACCESS called for a data set that was not opened for SyncIO writes.
	011E	--	An error was detected in an input MMIBLIST structure. Either the eyecatcher was bad or the number of MMIBs is invalid (only values of 1 or 2 are supported).
	011F	--	An error was detected in an input MMRE LIST structure. Either the eyecatcher was bad or the number of MMREs is not the same as the number of MMIBs in the input MMIBLIST.
	0120	--	An MMCALL parameter was specified which is not supported with the MMIBLIST parameter, which is also specified. These parameters include the following: OP=RDWR is the only allowable OP= parameter.
	0121	--	Specification of a DSSB address in an MMPR when MMIBLIST parameter is specified is not supported.
	0122	--	Specification of MMIBLIST with an MMPR requires an MMPR version of at least 10.
	0123	--	Update writes only (no preformat, no format writes, no reads) with MMIBLIST (i.e. dual logging).

	…	…	…

Updates to z/OS MVS System Messages Volume 9 (IGF-IWM) (SA38-0676-40)

z/OS MVS System Messages Volume 9 (IGF-IWM) is updated with OA59581.

Messages IGW289I and IGW290I were changed in the z/OS MVS System Messages Volume 9 (IGF-IWM). For message IGW289I, the format of the summary was changed to include additional columns, and the explanation was updated. For message IGW290I, a new reason 'Dual logging requires both data sets to be enabled' was added. The complete messages are as follows:

IGW289I

```
IGW289I
D SMS,DSNAME,STATS(ZHLWRITE) Start of Report
DATA SET datasetname
STATISTICS SINCE timestamp
SUMMARY:

        TOTAL     %SYNC -------------%ASYNC---------------
  WRITE REQUESTS WRITES   SKIP LNKBSY   ¬EST   MISC DISABL
           stwr   spsy   spsk   splb   spne   spmc   spdi
                        -------%ASYNC-------
                          MISS  DELAY   DUAL
                          spms   spdl   spdu
DEVICE STATISTICS
            TOTAL %SYNC--------------- %ASYNC-------------------
--
SSID DEVNO WRITES WRITES   SKIP LNKBSY   ¬EST   MISC   MISS
DELAY
dsss  dsdn   dstw   dssy   dssk   dslb   dsne   dsmc   dsms
dsdl
D SMS,DSNAME,STATS(ZHLWRITE) End of Report
```

Explanation: This message is issued in response to a D SMS,DSNAME(dsn),STATS(ZHLWRITE) command. It shows the time of the last reset of these statistics, or, if they were never reset, the time that the data set was opened. This message provides the zHyperLink write statistics for the data set in two sections. The first section has the summary information for the data set, and the second section shows the statistics per device. For the first section, only the first asynchronous reason encountered (if any) is counted. For the second section, only devices for which there was I/O activity since the time indicated by *timestamp* are displayed.

In the message text:
datasetname is the name of the data set. For VSAM data sets, this must be a component name. Sphere name will not work.

timestamp is the time from which zHyperLink write statistics were collected for this data set. This will reflect the time that these statistics were last reset, or if never reset, the time that the data set was opened.
SSID is short for storage subsystem ID
DEVNO is short for device number
TOTAL WRITES is the number of zHyperLink writes for a device
%SYNC WRITES is the percentage of zHyperLink writes that were completed synchronously
%ASYNC is the set of reasons for which a zHyperLink write went asynchronous
SKIP is the percentage of zHyperLink writes for which zHyperLink was not attempted due to a previous zHyperLink failure to the same track that is being written to
LNKBSY is the percentage of zHyperLink writes that encountered a busy link condition
^EST is the percentage of zHyperLink writes where zHyperLink write access was not established
MISC is the percentage of zHyperLink writes that were completed asynchronously due to other reasons
DISABL is the percentage of zHyperLink writes where zHyperLink was disabled. Please see the explanation for message IGW290I below for a list of reasons.
MISS is the percentage of zHyperLink writes that were completed asynchronously due to a cache miss
DELAY is the percentage of zHyperLink writes that were completed asynchronously due to an operation delay
DUAL is the percentage of zHyperLink writes that were completed asynchronously due to the other data set in a dual logging request.
stwr is the total number of zHyperLink write requests for the data set. If this number exceeds the display space available, E notation (with a lower case e) will be used.
spsy is the percentage of the total number of zHyperLink write requests of successful zHyperLink writes
spsk is the percentage of the total number of zHyperLink write requests that were skipped for zHyperLink due to a previous asynchronous write
splb is the percentage of the total number of zHyperLink write requests that went asynchronous due to a busy link condition
spne is the percentage of the total number of zHyperLink write requests that went asynchronous due to an inability to acquire a complete set of write tokens
spmc is the percentage of the total number of zHyperLink write requests that went asynchronous due to miscellaneous reasons
spdi is the percentage of the total number of zHyperLink write requests that were disabled for zHyperLink
spms is the percentage of the total number of zHyperLink write requests that went asynchronous due to a cache miss
spdl is the percentage of the total number of zHyperLink write requests that went asynchronous due to an operation delay
spdu is the percentage of the total number of zHyperLink write requests that could have been completed synchronously, but instead went asynchronous due to the other data set in a dual logging request
dsss is the storage subsystem id for the device

dsdn is the subchannel set id for the device followed by the device number for the device
dstw is the number of zHyperLink writes for this device. If this number exceeds the display space available, E notation (with a lower case e) will be used.
dssy is the percentage of the zHyperLink writes for this device that were completed asynchronously
dssk is the percentage of the zHyperLink writes for this device that were skipped for zHyperLink due to a previous asynchronous request
dslb is the percentage of the zHyperLink writes for this device that went asynchronous due to a busy link condition
dsne is the percentage of the zHyperLink writes for this device that went asynchronous due to an inability to acquire a write token, or due to an invalid write token
dsmc is the percentage of the zHyperLink writes for this device that went asynchronous due to miscellaneous reasons
dsms is the percentage of the zHyperLink writes for this device that went asynchronous due to a cache miss
dsdl is the percentage of the zHyperLink writes for this device that went asynchronous due to an operation delay

Note: If any percentage appears as '<0.01', it indicates that the number is nonzero but less than 0.01% of the value in *stwr* or *dstw*.

System action
None.

Operator response
Contact the system programmer.

System programmer response
The issuer of the command will use the result to diagnose potential zHyperLink write issues.

Problem determination
Depending on the statistics provided, some actions are recommended.

- For `SKIP`, a previous zHyperLink write failure may be the cause. Depending on the write pattern, the previous zHyperLink write failure may cause a high percentage of SKIP. Identify the next highest asynchronous percentage reason.
- For `LNKBSY`, there may be other zHyperLink activity that is impacting the zHyperLink writes for this data set.
- For a high percentage of `^EST` (zHyperLink write access not established) and MISC, contact IBM support for further diagnosis.
- For `MISS`, there may be other access to the data set that is impacting zHyperLink writes. Make sure that there are no other accesses to this data set.

- For `DELAY`, there may be other access to the data set or other zHyperLink activity that is impacting zHyperLink writes.
- For `DISABL`, message IGW290I may have been issued along with message IGW289I. If so, then check that message for the reason zHyperLink was disabled. Those reasons are counted in SMF type 42 subtype 6 records in the SyncIO section 2 fields.
- For `DUAL`, check the zHyperLink write statistics for the other data set specified for dual logging.

Source
Common Measurement Manager (CMM)

Routing code
2,11

Descriptor code
None.

IGW290I

IGW290I **DATA SET *datasetname***
zHyperLink Writes disabled *timestamp*
reason1

Explanation
This message is issued in response to a D SMS,DSNAME(*dsn*),STATS(ZHLWRITE) command when it is detected that zHyperLink writes are disabled.

In the message text:
datasetname
The name of the data set. For VSAM data sets, this must be a component name. The sphere name will not work.
timestamp
The time that zHyperLink writes were disabled for this data set.
reason1
The reason that zHyperLink writes are disabled for this data set. Possible values are:

- The storage class setting disabled zHyperLink writes.
- The operator setting disabled zHyperLink writes.
- zHyperLink writes were disabled due to the environment.
- Data set was not Opened for zHyperLink writes.
- zHyperLink write access was not established.
- Data Set was was extended after Open.
- Data Set was not eligible for zHyperLink writes.
- An internal error occurred.
- Unsupported copy relationship.

- Buffers not on a page boundary.
- Invalid request.
- zHPF not enabled.
- Dual logging requires both data sets to be enabled.
- Other.

System action
None.

Operator response
None.

System programmer response
The issuer of the command will use the result to determine why zHyperLink writes may be disabled. If the reason is "other," contact IBM support.

Problem determination
Depending on the reason provided, certain actions are recommended.

If the reason is `storage class disabled zHyperLink writes` or `operator setting disabled zHyperLink writes`, issue D SMS,DSNAME(*dsn*),zHL to determine the current zHyperLink settings for the data set.

If the reason is `zHyperLink writes disabled due to environment`, ensure that:
- zHyperLink writes are enabled on the system via the SETIOS command.
- zHyperLink writes are enabled on all of the devices that the data set resides on.
- If Metro Mirror is active, that secondaries are in full duplex.

If the reason is `Data set not Opened for zHyperLink writes`, check the application settings.

If the reason is `Data set not eligible for zHyperLink writes`, check the data set characteristics to ensure that it is eligible for zHyperLink writes. Some reasons the data set may not be eligible for zHyperLink writes are because the CI size is not 4 K, one or more extents is elss than 15 tracks, or the data set is multivolume non-striped or multi-layer striped. For more information, see Defining use of zHyperLinks in *z/OS DFSMSdfp Storage Administration*.

If the reason is `zHyperLink write access not established`, this may be a temporary condition. In this case, wait for zHyperLink write access to be established.

If the reason is `Unsupported copy relationship`, ensure that none of the volumes that the data set resides on are part of an XRC, FlashCopy, Concurrent Copy, or Global Mirror

relationship. If it is detected that any volumes are part of one of these relationships, zHyperLink writes will be disabled for the duration of the Open.

If the reason is `Buffers not on a page boundary` or `Invalid request`, zHyperLink writes will be disabled for the duration of the Open after these conditions are detected. These are considered application errors.

If the reason is `zHPF not enabled`, check the zHPF settings to ensure that the function is enabled.

If the reason is is `Dual logging requires both data sets to be enabled`, issue the DISPLAY SMS,DSNAME(*dsn*),STATS(ZHLWRITE) command on the other data set for dual logging to determine why the other data set was disabled for zHyperLink Writes.

If this message occurs with IGW292I variant 1, or the reason is `An internal error occurred` or `Other`, contact IBM support.

Source
Common Measurement Manager (CMM)

Routing Code
2,11

Descriptor Code
None.

Updates to z/OS MVS System Management Facilities (SMF) (SA38-0667-40)

z/OS MVS System Management Facilities (SMF) is updated with OA59581.

SMF Type 42 Subtype 6 header

The SMF type 42 subtype 6 header was updated to add the following in red:

Offsets		Name	Length	Format	Description
96	60	S42DSS2O	4	binary	Offset to synchronous I/O section 2.
100	64	S42DSS2L	2	binary	Length of synchronous I/O section 2.
102	66	S42DS2FL	1	bitstring	Sync_IO section 2 descriptor flags.
		S42DS2DL		1...	Media Manager dual logging is installed on this system, and the newly defined dual logging sync_IO SMF fields are valid if S42DSS2O is not 0.
103	67	*	1	binary	Reserved.
104	68	S42DSS3O	4	binary	Offset to synchronous I/O section 3.
108	6C	S42DSS3L	2	binary	Length of synchronous I/O section 3.
110	6E	*	2	binary	Reserved.

SMF Type 42 Subtype 6 Synchronous I/O Section 2

New fields were added to the SMF Type 42 Subtype 6 Synchronous I/O Section 2 as follows:

Offsets		Name	Length	Format	Description
...	...	...	...	...	...
96	60	S42SNTWH	4	binary	Number of SyncIO write requests where zHyperLink writes were disabled due to the other data set in a dual logging request being disabled for zHyperLink writes. Valid when S42DS2DL is ON.
100	64	S42SNTDR	4	binary	Number of SyncIO write requests where dual logging was specified. Valid when S42DS2DL is ON.
104	68	S42SNTDX	4	binary	Number of SyncIO write requests where all IO to this data set is completed synchronously, but the IO to the other data set is completed asynchronously, resulting in the entire request being completed asynchronously. Valid when S42DS2DL is ON.

108	6C	*	4	binary	Reserved