

Session 13081

Common z/OS Problems You Can Avoid



SHARE San Francisco, CA

February 6th, 2013



Evan Haruta
Patty Little

haruta@us.ibm.com
plittle@us.ibm.com

IBM Poughkeepsie

Trademarks

- **The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.**
 - **MVS**
 - **OS/390®**
 - **z/Architecture®**
 - **z/OS®**

* Corporation Registered trademarks of IBM

Contents

- OPERLOG Duplexing
- Logger, CFSizer
- NIPCONS
- JES2 Performance Data (\$DPERFDATA)
- PFA ZFS filesystem exhausted
- PFA INI JAVAPATH
- Using IEAOPTxx defaults
- CSVLLAxx REMOVE(*libname1,libname2,...*)
- GRS Star cpu utilization
- ICSF & SSL
- SDUMP AUXMGMT issues

OPERLOG Duplexing

Problem:

- During a message flood, installations may see the deactivation of the OPERLOG extended MCS console and thus an OPERLOG failure.
- **IEA631I** OPERATOR *OPLOGY2 NOW INACTIVE,
SYSTEM=SY2
- **CNZ4201E** OPERLOG HAS FAILED

OPERLOG Duplexing

Explanation:

- D C,HC

CNZ4100I 16.16.55 CONSOLE DISPLAY 302

CONSOLES MATCHING COMMAND: D C,HC

MSG:CURR=0 LIM=5000 RPLY:CURR=4 LIM=60
SYS=SY2 PFK=FT

HARDCOPY LOG=(SYSLOG, OPERLOG) CMDLEVEL=CMDS
ROUT=(ALL)

LOG BUFFERS IN USE: 0 LOG BUFFER LIMIT: 10000

- When the number of messages queued to the EMCS console exceeds the EMCS console QLIMIT the Operlog extended MCS console is deactivated

OPERLOG Duplexing

Explanation:

- Duplexing the OPERLOG logstream to staging datasets (STG_DUPLEX = YES) increases the recoverability of OPERLOG data in the event of a coupling facility failure.
- But, duplexing also increases overhead, slowing the servicing of OPERLOG synchronous write requests to the logstream.

OPERLOG Duplexing

D EMCS ,F ,CN=*OPLOGY2

CNZ4101I 16.15.40 DISPLAY EMCS 694

DISPLAY EMCS ,F ,CN=*OPLOGY2

NUMBER OF CONSOLES MATCHING CRITERIA: 1

CN=*OPLOGY2 STATUS=A CNID=03000003 KEY=OPERLOG

SYS=SY2 ASID=0009 JOBNAME=----- JOBID=-----

HC=N AUTO=N DOM=NONE TERMNAME=NONE

MONITOR=-----

CMDSYS=SY2

LEVEL=ALL AUTH= INFO

MSCOPE=SY2

ROUTCDE=NONE

INTIDS=N UNKNIDS=N

ALERTPCT=100

QUEUED=49999 QLIMIT=50000

SIZEUSED=5824K MAXSIZE=2097152K

OPERLOG Duplexing

Solution:

- During a message flood, slower synchronous write performance increases the likelihood of reaching the OPERLOG extended console QLIMIT, disabling queuing of messages to the OPERLOG EMCS console and the resulting OPERLOG data loss.
- Although a coupling facility failure without staging datasets (STG_DUPLEX = NO) makes recovering the OPERLOG logstream more difficult, messages missing from the logstream will also be available if SYSLOG is also active as a hardcopy medium.
- Installations running with both SYSLOG and OPERLOG as hardcopy media should consider the performance benefit of running without OPERLOG staging datasets.

Logger, CFSizer

- **Problem**: There are three flavors when System Logger encounters a size issue with the log structure.
 - Sufficient to allow the connection, but future connections may fail (**IXG201I**)
 - Structure is too small and is below the CF minimum size where the connect cannot be completed (**IXG206I/IXG207I**)
 - Structure is too large and may result in exaggerated offload times

Logger, CFSizer

- **IXG201I** REQUEST TO CONNECT TO LOGSTREAM DFHLGR32.SNEAPRMS.DFHJ00 IN STRUCTURE DFHLGR32 ACCEPTED. CONNECTION TO ADDITIONAL LOGSTREAMS MAY FAIL DUE TO INSUFFICIENT STRUCTURE STORAGE
- **IXG206I** CONNECT FAILED FOR LOGSTREAM HLM.MESSAGE.LOG IN STRUCTURE HLM_LOG. NO SUITABLE COUPLING FACILITY FOUND.
- **IXG207I** CF NAME: ST132 REASON CODE: 00000007 CF MINIMUM SIZE: 9216K BYTES.

Logger, CFSizer

<http://www-947.ibm.com/systems/support/z/cfsizer/>

- **System z Coupling Facility Structure Sizer Tool (CFSizer).** CFSizer is a web-based application that will return structure sizes based on the latest CFLEVEL for the IBM products that exploit the coupling facility.
 - Easy to use
 - Minimal input data required
 - Specify peak usage input
- **Sizing for:** APPC, BatchPipes, CICS, CommServer, DB2, DFSMSshm Common Recall Queue, Enhanced Catalog Sharing, GRS, HealthChecker, IBM Sessions Manager, IMS, InfoSphere, JES, Logrec, MQSeries, OEM, Operlog, RACF, RRS, SMF, TAPE, VSAM RLS, WLM, XCF.

Logger, CFSizer

IBM CFSizer LOGREC web page to size a LOGREC coupling facility structure - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Yahoo! Tools Help

ZSW01971USEN.PDF (application/pdf Ob... x IBM CFSizer LOGREC web page to size a ... x +

www-947.ibm.com/systems/support/z/cfsizer/logrec/

AdAware SECURITY TOOLBAR search with blekko SEARCH This page is SAFE! Clear Browsing Data >>

Worldwide Welcome back [IBM Sign in / Register]

IBM Industries & solutions Services Products Support & downloads My IBM Search

IBM Systems support > System z > CFSizer >

CFSizer

- APPC >
- BatchPipes >
- CICS >
- Communications Server >
- DB2 >
- DFSMSHsm Common Recall Queue >
- Enhanced Catalog Sharing >
- GRS >
- Health Checker >
- IBM Sessions Manager >
- IMS >
- InfoSphere >
- JES >
- LOGREC**

LOGREC
Coupling facility selection parameters

To size a LOGREC coupling facility structure, click the product checkbox and provide the requested input data. Default values have been provided for all the input data fields. These are recommended default values from IBM product groups that may or may not be reflective of your environment. Modify the defaults as appropriate and then click Submit button below to size this structure.

LOGREC structure

[LOGREC structure help](#)

Writes per sec

10

Submit

start S... In... 7 P... IB... 3t... 3 L... >... C... 2 P... 100% Spam 5:25 AM

NIPCONS

- **Problem**: During IPL the IPL messages are not seen.
- May not know where the NIPCONS was defined, or the definition may have changed, or the original NIPCONS may have a hardware problem.

NIPCONS

- **Solution**: From HMC shut down channel subsystem to force IPL msgs to the HMC
- On HMC:
 - Select the corresponding image and then open the off/on task
 - Toggle the required chpid to standby and apply
- Need to know which chpids connect the system to non-SNA 3270 consoles (or emulators if using OSA-ICC paths, or a 2074 like device) and use above procedure



JES2 \$DPERFDATA

- **Problem**: Checkpoint delays can surface in different ways, including recurring messages
- **\$HASP263** WAITING FOR ACCESS TO JES2 CHECKPOINT VOLUME XYZ
- **\$HASP9207** JES2 CHECKPOINT LOCK HELD

JES2 \$DPERFDATA

- **Problem**: Other JES2 performance delays may occur for a variety of reasons, including job throughput issues, checkpoint delays
- Session 13026 JES2 Performance Considerations – Tom Wasik

JES2 \$DPERFDATA

- **Solution**: JES2 gathers internal performance statistics which can be displayed via operator commands
- Commands are primarily intended for use by Service, are internal, and thus not documented in JES2 commands manual. However, they can be used by customer installations
- Very useful (often requested by L2 support) in diagnosing JES2 performance problems (*CPU increase, overall job throughput, etc*) as well as *checkpoint tuning*

JES2 \$DPERFDATA

- **Solution**: Key information displayed includes
- Summary of checkpoint statistics including average checkpoint HOLD and DORMANCY values
- CPU time consumed and wall clock run time consumed for each JES2 PCE
 - ✓ IO counts for each PCE
 - ✓ \$WAIT times/counts for each PCE
 - ✓ \$POST reasons/times/counts for each \$WAIT
 - ✓ more... (see reference section)

JES2 \$DPERFDATA

- **Solution:**
- First setup JES2 to gather the appropriate JES2 PERFDATA. Since data is gathered continuously, need to reset statistics and wait 10-15 minutes before displaying.
- **\$T PERFDATA(*),RESET** then wait 10-15 min

JES2 \$DPERFDATA

- **Solution**: Display the statistics during normal operation times, *before&after* tuning checkpoint, *before&after* adding/removing members, *before&after* large change in workload, etc....
- All statistics \$D PERFDATA(*),L=Z
- Checkpoint stats \$D PERFDATA(**CKPTSTAT**)
- CPU statistics \$D PERFDATA(**CPUSTAT**)
- PCE statistics \$D PERFDATA(**PCESTAT**)
- other displays available (see reference section)

JES2 \$DPERFDATA

- **Solution:** PERFDATA and tuning considerations
- Serves as a baseline in cases where performance problems arise (often requested by L2 support)
- Any checkpoint tuning changes made based on observations in PERFDATA should be done in a very gradual and iterative fashion (monitor results with additional PERFDATA sampling).

JES2 \$DPERFDATA

- **Solution:** References
- Washington Systems Center
FLASH10008 – JES2 Performance Data
Command
- Presentation San Francisco SHARE
Sessions 13026, 13029 "JES2
Performance Considerations"

PFA ZFS filesystem exhausted

Problem: The PFA (Predictive Failure Analysis) filesystem may be exhausted (out of space)

```
IOEZ00551I Aggregate <name.of.zfs.aggregate>  
ran out of space
```

```
AIRH1xxI Last model of future  
<PFA_CHECK_NAME> attempted at  
lastmodeltime was unsuccessful.  
Modeling is next scheduled to occur  
at nextmodeltime.
```

PFA ZFS filesystem exhausted

Problem :

- Secondary symptoms can result from PFA's ZFS filesystem being exhausted
 - PFA cannot write to its data files. In some cases, these data files may contain truncated records.
- If PFA modeling does not complete in 15 minutes wall clock, PFA cancels the PFAx spawned address space and AIR022I reflects this has happened with a SIGKILL (UNIX SIGNAL of 9)

PFA ZFS filesystem exhausted

Problem:

- **AIR022I** REQUEST TO INVOKE MODELING FAILED FOR CHECK NAME= PFA_MESSAGE_ARRIVAL_RATE
UNIX SIGNAL RECEIVED= 00000009 EXIT VALUE= 00000000
- **Note:** OA39526 now allows PFA to handle the truncated data so as to prevent modeling from failing.

PFA ZFS filesystem exhausted

Explanation :

- PFA uses ZFS filesystem to hold its data and log files
- If the ZFS filesystem is created too small to accommodate either normal PFA activity, or spikes in activity, the ZFS filesystem may run out of space if it has not been defined properly
- The ***z/OS V1R13.0 Problem Management*** guide gives recommendations for establishing space for the PFA ZFS filesystem.

PFA ZFS filesystem exhausted

Solution 1 :

- PFA's ZFS' filesystem is defined with the recommended values that are documented in Section 3.1.5.1 of "**z/OS V1R13.0 Problem Management**" Book.

V1R12 (HBB7770) - 200 cylinders primary; 50 cylinders secondary on a 3390 device.

V1R13 (HBB7780) - 300 cylinders primary; 50 cylinders secondary on a 3390 device.

PFA ZFS filesystem exhausted

Solution 2: Allow the PFA zFS to dynamically extend itself. By default, it will not do this

zFS is unlike HFS, in that it will not extend dynamically by default. zFS must be told to extend dynamically via the use of the GLOBAL 'aggrgrow' parmlib option, specified in the zfs IOEPRMxx parmlib or via a filesystem specific mount parm AGGRGROW.

In addition to the above, a zFS aggregate must have been defined with a secondary extent value when the IDCAMS DEFINE was done for the VSAM LDS (which is the zFS aggregate/filesystem)

PFA ZFS filesystem exhausted

Solution 2:

However, this will not be effective for currently mounted filesystems AND the IOEFSPRM change would also be required to make the change permanent.

After the zfsadm command was issued, the filesystem(s) affected would have to be unmounted and remounted to pick up this dynamic change and be allowed to dynamically grow.

Another possibly less disruptive alternative would be to grow the zfs aggregate manually to a larger size using the zfsadm grow command. First determine the current size in 'K' bytes using the 'zfsadm aggrinfo' command, then use 'zfsadm grow THE.AGGR.NAME -size xxxx' command to manually grow the aggregate to a larger size and confirm with the 'zfsadm aggrinfo' command afterwards.

PFA ZFS filesystem exhausted

Solution 2:

```
BROWSE      SYS1.PARMLIB( IOEPRMxx) - 01.00
Command ==>
***** Top of Data *****
*   ZFSPRMxx MEMBER FOR ZFS SUPPORT -                               *
TRACE_TABLE_SIZE=32M
trace_dsn=OMVS.SYSB.ZFSTRACE.TABLE
aggrgrow=on ←=====
*debug_settings_dsn=OMVS.SYSB.ZFS.DEBUG
sysplex=filesystem
sysplex_admin_level=2
romount_recovery=on
***** Bottom of Data ***
```

PFA INI JAVAPATH

Problem : Error messages issued at PFA modeling time

- **AIR022I** REQUEST TO INVOKE MODELING FAILED FOR CHECK NAME=
PFA_LOGREC_ARRIVAL_RATE
UNIX SIGNAL RECEIVED= 00000000 EXIT
VALUE= 00000002
- **AIR033I** PFA has detected that SMF is not running and has stopped processing the *PFA_SMF_ARRIVAL_RATE* check. Processing will resume after SMF restarts

PFA INI JAVAPATH

Problem: PFA modeling will fail if JAVAPATH is incorrectly defined in either

- /etc/PFA/ini **or**
- PFA EXEC
PGM=AIRAMBGN,REGION=0K,TIME=NOLIMIT,
PARM='path=(/usr/lpp/bcp) '
- **Note:** PARM= in the PFA proc will override the JAVAPATH statement in the ini file

PFA INI JAVAPATH

Problem : Example of ini file:

```
/*This file customized 14Sep2011 09:19:22 by Serverpac Job */  
VERSION=01010101  
/* NLSPATH = path to NLS files */  
/* LIBPATH = path to JNI library using libpath */  
/* JAVAPATH = path to JAVA code used for PFA */  
PATH= /usr/lpp/java/J5.0/bin/classic:/usr/lpp/java/J5.0/bin  
NLSPATH= /usr/lpp/nls/msg/%L/%n:/usr/lib/msg/%L/%n.catxlc/bin  
LIBPATH=/usr/lpp/java/J5.0/bin:/usr/lpp/java/J5.0/bin/  
        classic:/lib:/usr/lib:  
LANG= C  
JAVAPATH= /usr/lpp/bcp
```

PFA INI JAVAPATH

Explanation :

- The JAVAPATH statement identifies the location of where PFA's Java code used for modeling resides
- It does NOT represent where JAVA 6.0 code resides



PFA INI JAVAPATH

Solution :

- Check the ini file to ensure that it does not point to Java 6.0 code, but rather PFA's Java modeling code
- Check the PARM= value in the PFA PROCLIB EXEC statement to ensure it does not point to Java 6.0 code, but rather PFA's Java modeling code

Using IEAOPTxx defaults

Symptoms:

- Unexplained Capture Ratio frequently below 50% even though CPU usage remains consistent
 - Note: Capture Ratio =
$$\text{Captured Time} / \text{Total CPU time}$$
- No obvious problems nor unusual symptoms seen in dumps
- Little to no paging activity

Using IEAOPTxx defaults

Explanation:

- RMPTTOM value was set too low
 - Defines how frequently SRM algorithms are driven
- More time spent processing SRM timer functions than needed, increasing MIPS unnecessarily

Note:

- RMPTTOM value should be not be raised beyond 3000-5000 on production systems

Using IEAOPTxx defaults

Solution:

- Take system defaults as much as possible in IEAOPTxx parmlib.
 - A system change to an IEAOPTxx parameter default (via APAR or z/OS release) will be overridden by a coded parameter
- Often as few as 3-5 parameters are needed to be coded in IEAOPTxx
- If you have more than 5 parameters coded in IEAOPTxx, take time to review which are absolutely necessary

Using IEAOPTxx defaults

```
/*
/*
/* Example of IEAOPTxx with large number of coded values
/*
/*
/*****
ERV=60000, /* ENQUEUE RESIDENCE VALUE */
RCCFXET=(82,89), /* MPL ADJUSTMENT - FX STOR - 1ST 16 MB */
RCCFXTT=(65,75), /* MPL ADJUSTMENT - FX STOR - ONLINE */
RCCPTRT=(85,95), /* MPL ADJUSTMENT - PAGE FAULT RATE */
RCCUICT=(2,4), /* MPL ADJUSTMENT - UIC THRESHOLD VALUES */
RMPTTOM=1000, /* SRM INVOCATION INTERVAL IN MILLISECONDS */
ESCTVF=100, /* AGE VIRT FETCH PG GOES TO EXP */
ESCTVIO=1500, /* AGE VIRT I/O PG GOES TO EXP */
HIPERDISPATCH=NO, /* FOR SYSTEM Z10 SERVER */
LSCTFET=(75,85), /* PCT STG FIXED IN FIRST 16 MB */
MCCFXEPR=90, /* PCT STOR FIXED IN FIRST 16 MB */
MCCFXTPR=80, /* PCT STOR FIXED OR ALLOC FOR PGIN/PGOUT */
MCCMAXSW=512, /* MAX SIZE SWAP SET (FRAMES) */
CCCSIGUR=45, /* MIN. MEAN-TIME-TO-WAIT IN MILLISECONDS */
CNTCLIST=NO, /* CLIST IS A SINGLE TRANSACTION */
CPENABLE=(10,30), /* PCT I/O INTERR PROCESSD THRU TPI IN IOS */
DVIO=YES, /* DIRECTED VIO IS ACTIVE */
PROJECTCPU=YES, /* ZIIP CAPACITY PLANNING */
RCCCPUT=(120.0,120.0), /* MPL ADJ - CPU UTILIZATION */
SELTAPE=RANDOM, /* TAPE SELECTION ALGORITHM */
STORAGESERVERMGT=NO, /* I/O PRIORITY MANAGER - DEFAULT VALUE */
SWAPRSF=10.0 /* EXCH SWAP WEIGHT */
```

CSVLLAxx

REMOVE(*libname1,libname2,...*)

Problem:

- Unusually high elapsed time of IMS transactions running in MPRs (Message Processing Regions) in an IMS shared queues environment
- The high transaction elapsed times are experienced on only a subset of the IMSplex members.

CSVLLAxx

REMOVE(*libname1,libname2,...*)

Explanation:

- Investigation suggested that the *time to load an application program* was a probable contributor to the high elapsed time of IMS transactions
- SCHED-DLI is influenced significantly by the time it takes to load a program
- Check:
 - ✓ your preload list
 - ✓ BLDL time caused by scanning large PDS directories
 - ✓ response times of DASD to load programs, etc...

CSVLLAxx

REMOVE(*libname1,libname2,...*)

Solution:

- The performance problem was the result of using CSVLLAxx to REMOVE a LNKLST library from LLA management
- Use REMOVE to remove a **NON-LNKLST** library from LLA management. Don't use REMOVE in CSVLLAxx to take a LNKLST library out of LLA management. If you want to remove a LNKLST library from LLA management, create and activate a new LNKLST without the library.

GRS Star CPU utilization

Problem:

- Increase in GRS CPU utilization in GRS STAR mode after merging workloads or changing hardware configuration
- In environment where CF LPARs are sharing CP.
- Note that changes made to CF LPAR definitions can affect CF service times.



GRS Star CPU utilization

Explanation:

- GRS ISGLOCK structure is in a CF that shares CP
- GRS ISGLOCK requests are synchronous, meaning that GRS will spin waiting for a response from the CF
 - Longer CF service time => more spinning => increased CPU utilization for the GRS Task that handles global ENQ/DEQ requests in star mode (ISGWDR).
- Must assess the importance of the workload running in the CF LPAR that is sharing the CP with our CF LPAR where the ISGLOCK structure resides.

GRS Star CPU utilization

Solution:

- The best setting for the environment depends on the goals and expectations for each CF.
- For the less important CF workload:
 - Set dynamic dispatching on (DYNDISP=YES).
 - When CF is not very busy, it can "give up" or "donate" its time to another image.
 - Give it a higher weight to ensure it gets CP regularly
- For the more important CF workload:
 - Leave dynamic dispatching off (DYNDISP=OFF)
 - Give it a lower weight so it does not "hog" the CP
- If CF workloads are equal and are weighted at 50, consider setting DYNDISP=YES for both.

GRS Star CPU utilization

Solution:

- Here is a paper that discusses Coupling Facility Configuration Options for customers to reference:
- <ftp://public.dhe.ibm.com/common/ssi/ecom/en/zsw01971usen/ZSW01971USEN.PDF>

ICSF & System SSL

Problem:

- Increased CPU usage on application which exploits System SSL to perform secure client-server communication (e.g. CICS, MQ, FTP, Telnet, TCP/IP, etc.)
- Sometimes all exploiting applications experience increased CPU usage during DR testing or after machine upgrade.



ICSF & System SSL

Explanation: There are 2 phases on a System SSL secure client-server communication: *SSL handshake* and *data transfer*.

During the *SSL handshake* phase, PKA (**public key algorithm**) cryptography is used. Most of the work is done on either a crypto coprocessor or a crypto accelerator.*



During the *data transfer* phase, data will be encrypted using the cipher algorithm that was decided upon between the server and client during the handshake. If the cipher was DES, TDES or AES, then the cryptography is done by the hardware **



ICSF & System SSL

- **Explanation:** System SSL code that performs secure client-server communication runs under the server or client address space. **It will invoke its own SSL software routines when the cryptographic function is not available**
- It is the time spent running the SSL software routines that drives up the CPU time, instead of having the hardware perform the function

ICSF & System SSL

- **Example 1:** Customer was doing DR testing on a DR machine. They knew they needed to logon to TSO and set the various types of **master keys** (e.g. DES, AES, PKA (or called RSA now), ECC) in the domain via the **ICSF Panel**, so as to activate the corresponding hardware functions on the coprocessors.
- Many shops have automation to start ICSF first, followed by the client-server applications. If the '*master key set*' action is done **after** these applications are started then System SSL (at the application initialization time) will notice that there are no coprocessors available yet, and will perform handshake PKA cryptography functions using SSL software routines, causing increased CPU usage.

When the '*master key set*' action is finally done later, System SSL will not know and will continue to use software to perform PKA crypto functions, until the application is either recycled or refreshed via AT-TLS.



ICSF & System SSL

- **Example 2**: Customer changed PKA or RSA master key, while the client-server applications continue to run.
- One of the steps needed to change PKA/RSA master key is to disable the 'PKA Callable Services'
 - The disable 'PKA Callable Services' step is required on 'all systems' sharing the same PKDS, as long as there is at least one system running HCR7780 or lower ICSF.
- This means that System SSL will use SSL software routines to perform PKA cryptography functions for subsequent handshakes for the application from that time onwards.



ICSF & System SSL

- **Example 3**: Customer fixed some ICSF problem and recycled ICSF, while the client-server applications continue to run



ICSF & System SSL

Solution (Examples 1,2,3):

- Recommendation: When coprocessors are activated after the client-server application, either
 1. Restart the application, OR
 2. Refresh the application via AT-TLS (assuming application is running with AT-TLS) OR
 3. Issue the application's command to avoid recycling the application (only some applications have such commands)



SDUMP MAXSPACE

Problem:

DB2 dump was partial due to reaching MAXSPACE. What should I set MAXSPACE to?

- **IEA043I** SVC DUMP REACHED MAXSPACE LIMIT - MAXSPACE=xxxxxxxxx MEG
- **IEA611I** {COMPLETE|PARTIAL} DUMP ON dsname. MAXSPACE LIMIT REACHED WHILE CAPTURING DUMP

SDUMP MAXSPACE

Explanation:

- MAXSPACE parameter acts as a throttle to limit the maximum amount of virtual storage that SDUMP can “capture” at any given time.
 - Storage can belong to one or more captured SDUMPs
 - MAXSPACE set via CHNGDUMP (CD) command
- **CD SET ,SDUMP ,MAXSPACE=yyyyyyyyyyMeg**
(default = 500M, can range from 1-999999999)

SDUMP MAXSPACE

Solution:

1. Check sizes of your largest dumps. Given these sizes, what seems like a reasonable value for MAXSPACE?
2. Examine your AUX storage definitions. How much is 1/3rd of your AUX?
3. If Answer1 \leq Answer2, then choose a MAXSPACE value in between the two. This will protect your system, while giving you the greatest probability of obtaining a complete dump.

SDUMP MAXSPACE

Solution:

4. If Answer1 > Answer2, then you need to make a decision.
 - To minimize the likelihood of a partial dump, increase your AUX storage definition to at least 3 times the MAXSPACE that you require.
 - If you are not in a position to increase your aux storage definition, then you will need to lower MAXSPACE to 1/3rd of the defined size.

Considerations:

- Partial dumps compromise the ability to diagnose critical problems
- SDUMP tries to dump storage strategically by starting with the more critical areas of storage

SDUMP AUXMGMT

Problem:

I ran into AUX storage issues when taking an SVC dump. I'm using a reasonable MAXSPACE. Why did this happen ?

- **IRA205I** 50% AUXILIARY STORAGE ALLOCATED
- **IRA200E** AUXILIARY STORAGE SHORTAGE
- **IRA201E** CRITICAL AUXILIARY STORAGE SHORTAGE
- **IEE711I** [SYSTEM UNABLE TO DUMP | SYSTEM DUMP NOT TAKEN. A CRITICAL AUXILIARY STORAGE SHORTAGE EXISTS]

SDUMP AUXMGMT

Explanation:

Even with a properly set MAXSPACE, SDUMP can still trigger an AUX storage condition if the overall system is using a sizeable amount of AUX storage. The AUXMGMT parameter offers additional system protection.

SDUMP AUXMGMT

Solution:

Use AUXMGMT parameter!

- SDUMP AUXMGMT acts as a safety net **for systems exceeding recommended AUX utilization (=30%)**.
 - **CD SET,SDUMP,AUXMGMT=ON** (the default)
- New SDUMPs are prevented when AUX storage usage reaches 50%
- SDUMPs in the process of being captured are stopped when AUX usage reaches 65%.
- If AUXMGMT=OFF, then SDUMP function is not affected until AUX usage goes to 85% (critical)

SDUMP AUXMGMT

Problem:

AUXMGMT protection detected aux storage usage greater than 50% and is preventing any new SVC dumps from being taken. How do I recover my system's ability to take a dump?

- **IEA611I** {COMPLETE|PARTIAL} DUMP ON dsname. A CRITICAL AUXILIARY STORAGE SHORTAGE EXISTS

Note: SDUMP's critical storage indication means the AUXMGMT threshold has been reached, but doesn't mean the system has 70%-85% AUX storage used.

SDUMP AUXMGMT

Explanation:

A low threshold of 35% must be attained (35%) before SDUMP processing is allowed to resume.

- Resetting AUXMGMT=OFF after AUX storage utilization has reached the 50% threshold will *not* relieve the above low threshold requirement! Once you hit the AUXMGMT ON limit you **MUST** hit the low limit (35%) before SDUMPs will again be allowed.

SDUMP AUXMGMT

Solution:

There are two ways to attain the low limit:

1. CANCEL or wait for the address spaces that have pages on AUX to free the storage or the job to end
OR
2. Add page datasets such that the percentage of overall available AUX slots is then below 35%. If you hit a AUXMGMT limit, and **cannot** add additional page datasets, you will have to revert to option 1.

➤ If set correctly, MAXSPACE and AUXMGMT work hand in hand to protect the system.