E30

How to Setup and Gather Documentation for IMS Problems

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MVS Setup Recommendations
System Trace Table

⚠ **Set MVS System Trace table size to 999K**

- **Default size is only 64K**

- **The MVS command "TRACE ST,999K" can be specified in the MVS COMMNDxx SYS1.PARMLIB member.**

- **Advantages:**

  - ▶ **<u>Extremely</u> valuable for a <u>large</u> variety of problem types.**

- **Considerations:**

  - ▶ **System Trace Table is page fixed storage.**

  - ▶ **Installations need to ensure there are enough real page frames to make this specification.**

MVS Setup Recommendations
Master Trace Table

⚠ **Set MVS Master Trace Table size to 72K**

- **Default size is only 24K, approx. 336 messages**

- **"TRACE MT,72K" can be specified in the SCHEDxx member of SYS1.PARMLIB.**

- **Advantages:**

  ► **Master trace maintains a table of the most recently issued operator messages.**

  ► **Allows view of external events at the time of failure.**

- **Considerations:**

  ► **Ensure Master Trace Table is large enough to span most error time frames.**

MVS Setup Recommendations
Common Storage Tracker

⚠ **Turn on the MVS common storage tracking function to track ownership of CSA/ECSA. .**

- **Use the DIAGxx member to contain the request. <u>Specify DIAG=xx in the IPL system parameters</u> or use the SET DIAG=xx operator command.**

  - ▶ **Example: DIAGxx member: VSM TRACK CSA(ON)**

  - ▶ **See OS/390 MVS Diagnosis: Tools and Service Aids, OS/390 Initialization and Tuning Guide/ Reference, and MVS Systems Commands manuals for complete details.**

- **Advantages:**

  - ▶ **SVC dumps (or RMF reports) will provide CSA/ECSA ownership information with jobname, time, and requesting module information.**

- **Considerations:**

  - ▶ **Performance is degraded and ESQA utilized to a degree to which CSA workload occurs.**

MVS Setup Recommendations
CHNGDUMP MAXSPACE

⚠ **Ensure adequate CHNGDUMP MAXSPACE is specified to hold the internal SVC dump.**

- **Use the COMMNDxx SYS1.PARMLIB member to issue the appropriate CHNGDUMP command at IPL time.**
  - ► **Example: CD SET,SDUMP,MAXSPACE=1000M - Default size is 500M**
    - ▪ **2500M is standard for large multi-address space SVC Dumps.**
  - ► **See OS/390 MVS Diagnosis: Tools and Service Aids, OS/390 MVS Systems Commands, and OS/390 Initialization and Tuning Guide for additional details.**

- **Advantages:**
  - ► **Higher likelihood that SVC dumps will be captured in their entirety without worry of "<u>Partial Dump</u>".**

- **Considerations:**
  - ► <u>**Ensure local page datasets are large enough to contain their normal peak load plus additional SVC dumps!**</u>
  - ► **See OS/390 MVS Initialization and Tuning Guide for additional details.**
  - ► **See II06335 for additional details.**

MVS Setup Recommendations
Automatic Dump Dataset Allocation

⚠ **Ensure automatic dump dataset allocation is in place.**

- **Use the COMMNDxx SYS1.PARMLIB member to issue the appropriate DUMPDS commands to set this up.**

  ► **Example: DUMPDS NAME=, DUMPDS ADD, and DUMPDS ALLOC=ACTIVE**

  ► **See OS/390 MVS Diagnosis: Tools and Service Aids and OS/390 MVS Systems Commands manuals for complete details.**

- **Advantages:**

  ► **SVC dumps will be allocated to the correct size without worry of "<u>Partial Dump</u>".**

- **Considerations:**

  ► **Ensure assigned storage class has enough space to ensure adequate SVC dump storage requirements**

IMS Setup Recommendations
FMTO Option

⚠ **Specify IMS control region EXEC parm value: FMTO=D**

- ● **Produces an SDUMP for terminating and non-terminating errors**

  - ▶ **Non-terminating errors include:**

    - – **IMS dynamic allocation failures.**

    - – **Some ESAF failures.**

IMS Setup Recommendations
SYSMDUMP DD

⚠ **Specify SYSMDUMP DD in JCL of:**

- **IMS CTL Region.**

- **IMS DLI/SAS Region.**

- **IMS DBRC Region.**

⚠ **The SYSMDUMP specification will be used by IMS in the event that SDUMP processing should fail.**

⚠ **The following dump options should be specified in the SYS1.PARMLIB(IEADMR00) member to ensure that adequate areas of MVS storage are dumped to diagnose the problem under most circumstances:**

- **SDATA=(CSA,LSQA,RGN,SQA,SUM,SWA,TRT)**

IMS Setup Recommendations
SYSUDUMP DD

⚠ **Specify SYSUDUMP DD in JCL of:**

- **IMS Dependent Regions.**

⚠ **The SYSUDUMP specification will be used by IMS dependent regions for failure events.**

⚠ **The following dump options should be specified in the MVS SYS1.PARMLIB(IEADMP00) member to ensure that adequate areas of MVS storage are dumped.**

⚠ **SDATA=(CB,ERR,SUM) PDATA=(JPA,LPA,PSW,REGS,SA,SPLS)**

IMS Setup Recommendations
Table Traces

⚠ **IMS Dispatcher, Scheduler, DLI, and Lock traces set on.**

- ● **Specify the following options in the IMS PROCLIB member: DFSVSMxx**

  - ▸ **DISP=ON, SCHD=ON, DL/I=ON, LOCK=ON**

- ● **Or, use the IMS " /TRA SET ON TABLE nnnn " command**

  - ▸ **Where nnnn is altnernately = DISP, SCHD, DLI, and LOCK**

⚠ **The LATCH trace should be turned on in non-production environments.**

- ● **Carries overhead up to 10% as measured at STL.**

IMS Setup Recommendations
Interactive Dump Formatter

⚠ **Install the IMS Interactive Dump Formatter**

- **Provides IPCS menu driven dump analysis.**

- **Highly effective for RSV (Remote Screen Viewing) users.**

- **For more details see**

  - ▶ **IMS/ESA Utilities Ref: System**

  - ▶ **IMS/ESA Diagnosis Guide and Reference**

IMS Setup Recommendations
External Trace Environment

⚠ **IMS external tracing allows for IMS trace table output to be placed on IMS trace datasets rather than on the IMS OLDS when:**

- **DISP=OUT option is used in the DFSVSMxx PROCLIB member.**

- **LOG option is used with the IMS TRACE commands.**

⚠ **Increases IMS system throughput should external tracing be desired.**

⚠ **External trace datasets are allocated in the following order:**

1. **DASD JCL - DFSTRA01 and DFSTRA02 DDNAMES.**

2. **DASD MDA- DFSTRA01 and DFSTRA02 Dynamic Allocation Members.**

3. **TAPE MDA - DFSTRA0T Dynamic Allocation Member.**

4. **IMS OLDS - If none of the above are found.**

CQS Setup Recommendations
Trace Environment

⚠ **Specify the CQS Execution Parameter BPECFG=nnnnnnnn**

⚠ **Specify the following trace entries within the BPECFG=nnnnnnnn Proclib member:**

```
--DEFINITIONS FOR BPE SYSTEM TRACES

TRCLEV=(AWE,LOW,BPE)              /* AWE SERVER TRACE         *

TRCLEV=(CBS,LOW,BPE)              /* CONTROL BLK SRVCS TRACE  *

TRCLEV=(DISP,LOW,BPE)             /* DISPATCHER TRACE         *

TRCLEV=(LATC,LOW,BPE)             /* LATCH TRACE              *

TRCLEV=(SSRV,LOW,BPE)             /* GEN SYS SERVICES TRACE   *

TRCLEV=(STG,LOW,BPE)              /* STORAGE TRACE            *

TRCLEV=(USRX,LOW,BPE)             /* USER EXIT TRACE          *

--DEFINITIONS FOR CQS TRACES

TRCLEV=(CQS,LOW,CQS)              /* CQS GENERAL TRACE        *

TRCLEV=(STR,LOW,CQS)              /* CQS STRUCTURE TRACE      *

TRCLEV=(INTF,LOW,CQS)             /* CQS INTERFACE TRACE      *
```

Preservation of Standard Documentation

⚠ **Consider implementing normal operating procedures to preserve the following documentation near the time of error.**

- **MVS Console (SYSLOG)**

- **JES JOBLOG of jobs related to failure**

- **IMS Master Console Log**

- **SYS1.LOGREC**

- **Any Dumps Produced**

- **IMS OLDS/SLDS**

- **Additional manual dump intervention**

MVS Console (Syslog) Preservation

⚠ **The MVS Console should be saved to view relevant system messages.**

- **The ideal time frame:**

  ▸ **Back to the last IMS restart.**

- **The moderate time frame:**

  ▸ **24 hours of MVS Console messages.**

- **The minimum time frame:**

  ▸ **Two IMS system checkpoint intervals.**

JES JOBLOG Preservation

⚠ **The JES JOBLOG should be saved to view relevant Job related messages.**

- **Save the JES JOBLOGs for**
  - ▶ **The IMS Control Region**
  - ▶ **The IMS DLI/SAS Region**
  - ▶ **The IMS DBRC Region**
  - ▶ **Any suspicious IMS Dependent Regions**
  - ▶ **CQS Regions**

- **The ideal time frame:**
  - ▶ **JES JOBLOG from the current error execution**
  - ▶ **JES JOBLOG from the prior clean execution (For comparison)**

- **The moderate time frame:**
  - ▶ **24 hours of JES JOBLOG**

- **The minimum time frame:**
  - ▶ **Two IMS system checkpoint intervals or two hours, whichever is greater.**

IMS Master Console Log Preservation

⚠ **The IMS Master Console Log should be saved to view relevant IMS messages.**

- **The ideal time frame:**

  ▸ **IMS Master Console Log from the current error execution**

  ▸ **IMS Master Console from the prior clean execution (For comparison)**

- **The moderate time frame:**

  ▸ **24 hours of IMS Master Console**

- **The minimum time frame:**

  ▸ **Two IMS system checkpoint intervals or two hours, whichever is greater.**

SYS1.LOGREC Preservation

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

- **The ideal time frame:**

  - ▸ **Back to the last IMS restart.**

- **The moderate time frame:**

  - ▸ **48 hours of SYS1.LOGREC data.**

- **The minimum time frame:**

  - ▸ **Current SYS1.LOGREC dataset.**

Dump Preservation

⚠ **All associated IMS dumps should be retained.**

- **SYS1.DUMP Datasets should be examined.**

  - ► **Multiple dumps may be created.**

  - ► **Keep all dumps at time of failure regardless of the subsystem.**

- **SYSMDUMP for the IMS Control, DLI/SAS, and DBRC regions need to be examined in case of primary SYS1.DUMP failures.**

  - ► **Save these datasets if a dump was produced.**

- **SYSUDUMP should be saved for IMS dependent regions.**

IMS OLDS/SLDS Preservation

⚠ **The IMS OLDS/SLDS should be saved in case IMS Log analysis is required.**

- **The ideal time frame:**

  ► **From the time of the last IMS restart**

  ► **Prior execution**

- **The moderate time frame:**

  ► **24 hours of IMS Log Records**

- **The minimum time frame:**

  ► **Active IMS OLDS**

Additional Manual Dump Intervention

⚠ **IMS produces SDUMPs for <u>some</u> internal errors without human intervention.**

⚠ **IMS Wait/Loop or partial loss of function conditions will require intervention to produce an SVC dump.**

⚠ **Past experience indicates that IMS hangs can be caused by interaction with many address spaces including:**

- ► **IMS Control Region**
- ► **IMS DLI/SAS Region**
- ► **DBRC Region**
- ► **Troublesome IMS Dependent Regions**
- ► **IRLM Region**
- ► **CCTL Regions**

- ► **APPC**
- ► **VTAM**
- ► **ESAF - DB2, MQSeries, others**
- ► **Other Regions ???**
- ► **Other IMSplex members**
  - ▪ **With all their related regions as mentioned here.**

To Dump, or not to Dump...

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

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

⚠ **Time required to produce the dump must be weighed against the possibility that there may not be sufficient data to solve the problem, adding to the possibility that <u>the problem could recur.</u>**

IMS Dump Techniques

⚠ **IMS SVC Dumps can be requested using various techniques**

- **MVS SYS1.PARMLIB IEADMCxx**

  ► DUMP Command Parmlib

  ► Available OS/390 V2R6.0

- **MVS SYS1.PARMLIB IEASLPxx**

  ► SLIP Command Parmlib

- **MVS DUMP command**

- **Customized JCL can be built and submitted**

- **Others?....**

IEADMCxx, MVS SYS1.PARMLIB

⚠ **DUMP Command Parmlib Member**

- **For OS/390 operating systems V2R6.0 and above.**

⚠ <u>**Can be used to customize IMS dumps prior to error event.**</u>

⚠ <u>**Simple operator interface.**</u>

⚠ **Create SYS1.PARMLIB members called IEADMCxx for each customized dump command.**

- **See the following for more detailed information:**

  ▶ **OS/390 V2R6.0 MVS Initialization and Tuning Guide**

  ▶ **OS/390 V2R6.0 MVS System Commands**

⚠ **A SYS1.PARMLIB IEADMCxx example follows on the next page.**

IEADMCxx Example for IMS

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

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

```
Where:
    j1 = IMS Control Region Jobname. j3 = DBRC Region Jobname.
    j2 = IMS DLI Region Jobname.     j4 = IRLM Region Jobname.
```

⚠ **Create a 2nd SYS1.PARMLIB member called IEADMCI2 containing the following DUMP parameters:**

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

```
Where:
    j5 = IMS CCTL Region 1.              J7 = IMS CCTL Region 3
    j6 = IMS CCTL Region 2.
```

IEADMCxx DUMP Activation

⚠ **To request a dump from the IEADMCI1 and IEADMCI2 parmlib members, enter the following MVS commands:**

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

⚠ **Two dump datasets will be created on the MVS image from which the dump command was entered.**

IEASLPxx, MVS SYS1.PARMLIB

⚠ **SLIP Command Parmlib Member**

- **For OS/390 operating systems prior to OS/390 V2R6.0**

⚠ **Create a SYS1.PARMLIB member called IEASLPxx with the desired SLIP commands.**

⚠ **Advantages:**

- **Can be used to customize IMS dumps prior to error event.**

- **Simple operator interface.**

⚠ **Disadvantages:**

- **Must ensure no other PER SLIP is active on all systems before activating.**

IEASLPxx, MVS SYS1.PARMLIB Cont.

⚠ **See the following for more detailed information about IEASLPxx:**

- **OS/390 MVS Initialization and Tuning Reference**

- **OS/390 MVS System Commands**

⚠ **A SYS1.PARMLIB IEASLPxx example follows on the next page**

IEASLPxx Example

△ **Create SYS1.PARMLIB member called IEASLPxx containing the following SLIP entries:**

SLIP SET,IF,N=(IEAVEDS0,00,FF),A=(SYNCSVCD,TARGETID),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),
JL=(j1,j2,j3,J4),ID=IMS1,TARGETID=(IMS2),D,END

```
Where:
    j1 = IMS Control Region Jobname.
    j2 = IMS DLI Region Jobname.
    j3 = DBRC Region Jobname.
    j4 = IRLM Region Jobname (If IRLM DB Locking used).
```

SLIP SET,IF,N=(IEAVEDS0,00,FF),JL=(j5,j6,j7),ID=IMS2,
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT),D,END

```
Where:
    j5 = CCTL Region 1.
    j6 = CCTL Region 2.

    j7 = CCTL Region 3.
```

IEASLPxx SLIP Activation

⚠ **Before activating the SLIP, be sure to disable any existing PER SLIP.**

- **SLIP MOD,DISABLE,ID=trapid**

⚠ **To activate the SLIP trap and trigger the associated SVC dumps, enter the following MVS commands:**

- **SET SLIP=xx**

- **SLIP MOD,ENABLE,ID=IMS1**

⚠ **After the SET SLIP=xx, and SLIP MOD,ENABLE,ID=IMS1 commands are entered:**

- **Two dump datasets will be created on the MVS image from which the SLIP command was entered.**

IMS SYSPLEX Dump Considerations

⚠ IMS SYSPLEX implementations need to consider the possibility that a hang or problem on one IMSplex member may be due to a problem originating from another member.

⚠ Problems such as IMS Wait/Loops or partial loss of function conditions which require intervention to produce an SVC dump, should include SVC dumps from other members of the IMSplex.

⚠ Challenge:

- Ensure that a dump is taken for all necessary address spaces on each system.

Sysplex IEADMCxx Example

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

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

```
Where:
    j1 = IMS Control Region Jobname. j3 = DBRC Region Jobname.
    j2 = IMS DLI Region Jobname.     j4 = IRLM Region Jobname.
```

△ **Create a 2nd SYS1.PARMLIB member called IEADMCI2 containing the following DUMP parameters:**

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

```
Where:
    j5 = CCTL Region 1.              J7 = CCTL Region 3.
    j6 = CCTL Region 2.
```

Note: the XESDATA and REMOTE parms are for use in SYSPLEX environments.

Sysplex IEADMCxx DUMP Activation

⚠ **To request a dump from the IEADMCI1 and IEADMCI2 parmlib members, enter the following MVS command:**

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

⚠ **Two dump datasets will be created on each MVS image in the SYSPLEX matching the REMOTE specifications for the JOBNAMEs.**

Sysplex IEASLPxx Example

⚠ **Create SYS1.PARMLIB member called IEASLPxx containing the following SLIP entries: (See MVS Information Item II08920 for more details)**

SLIP SET,IF,N=(IEAVEDS0,00,FF),A=(SYNCSVCD,TARGETID),
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),
JL=(j1,j2,j3,J4),ID=IMS1,TARGETID=(IMS2),D,REMOTE=(JOBLIST,SDATA),END

```
Where:
    j1 = IMS Control Region Jobname. j3 = DBRC Region Jobname.
    j2 = IMS DLI Region Jobname.     j4 = IRLM Region Jobname.
```

SLIP SET,IF,N=(IEAVEDS0,00,FF),JL=(j5,j6,j7),ID=IMS2,
SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,XESDATA),REMOTE=(JOBLIST,SDATA),
D,END

```
 Where:
    j5 = CCTL Region 1.              J7 = CCTL Region 3.
    j6 = CCTL Region 2.
```

⚠ **Note: the XESDATA and REMOTE parms are for use in SYSPLEX environments.**

- **REMOTE JOBLIST request can be passed without breaking down individual jobnames.**

Sysplex IEASLPxx SLIP Activation

⚠ **Before activating the SLIP, be sure to disable any existing PER SLIP for each MVS image in the SYSPLEX.**

  ● **ROUTE *ALL,SLIP MOD,DISABLE,ID=trapid**

⚠ **To activate the SLIP trap and trigger the associated SVC dumps, enter the following MVS commands:**

  ● **SET SLIP=xx**

  ● **SLIP MOD,ENABLE,ID=IMS1**

⚠ **After the SET SLIP=xx, and SLIP MOD,ENABLE,ID=IMS1 commands are entered:**

  ● **2 dump datasets will be created on each MVS image in the SYSPLEX matching the REMOTE specifications.**

Specific Environment Considerations
Control Region Wait/Hang

⚠ **Control Region Wait/Hang**

- **Take a SVC dump using one of the methods discussed earlier in the presentation.**

- **Dumps should include related regions:**

  - ▶ **IMS Control Region**
  - ▶ **IMS DLI/SAS Region**
  - ▶ **DBRC Region**
  - ▶ **Troublesome IMS Dependent Regions**
  - ▶ **IRLM Region**
  - ▶ **CCTL Regions**

  - ▶ **APPC**
  - ▶ **VTAM**
  - ▶ **ESAF - DB2, MQSeries, others**
  - ▶ **Other Regions ???**
  - ▶ **Other IMSplex members**
    - ▶ **With all their related regions as mentioned here.**

- **If a partial wait occurs, consider taking two of the above mentioned SVC Dumps to identify normal activity versus abnormal activity.**

- <u>**Note: Modify dumps of IMS are no longer the preferred method to obtain wait documentation.**</u>

Specific Environment Considerations
IMS Loop

⚠ **If the IMS Control, DLI, DBRC or Dependent Region enters a loop state, perform the following:**

- **Set MVS system trace table size to 999K and turn branch trace on**

  ► **TRACE ST,999K,BR=ON**

- **If possible, and not already set, use IMS command: /TRA SET ON TABLE nnnn**

  ► **Where nnnn alternately = DISP, SCHD, DLI, LOCK, and LATCH.**

- **Take a SVC dump using one of the methods discussed earlier in the presentation with related IMS regions.**

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

- **Reset the MVS system trace table to its original settings.**
- **Note: Modify dumps of IMS are no longer the preferred method to obtain loop documentation.**

Specific Environment Considerations
ESAF Interface Problems

⚠ **Problems involving the ESAF (External Subsystem Attach Facility).**

- ● **Turn on the IMS SUBS TRACE to the external trace dataset.**

  - ► IMS command: /TRA SET ON TABLE SUBS OLDS

- ● **Take a SVC dump of the related regions before and after the recreate attempt.**

  - ► **Ensure that pertinent regions for the affected subsystem (dbtmstr, db2dbm1, mqseries) are included with the other related IMS regions.**

  - ► **Note: IMSplex partner dumps are probably not required for ESAF problems, unless they are also experiencing the problem.**

Specific Environment Considerations
DBRC Related Problems

△ **DBRC Related Problems**

- **Obtain a listing of the DBRC RECONs prior to repair attempts.**
  - ► **Use Recover Control Utility (DSPURX00) - LIST.RECON command.**

- **If the RECON dataset listing cannot be obtained due to size, then alternatively obtain a subsystem listing (LIST.RECON is preferred).**
  - ► **Use Recover Control Utility (DSPURX00) - LIST.SUBSYS ALL command**

- **If recreates are possible:**
  - ► **Obtain before and after copies of the RECONs.**

- **Use D GRS,CONTENTION command on each system sharing the RECON to determine if the RECON is held at the exclusion of other waiters.**
  - ► **If so, dump the owning adddress space.**
    - – **DUMP COMM=(dump title)**
    - – **R nn,JOBNAME=(j1),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),END**

- **See II10735 and II10915 for additional diagnostic information.**

Specific Environment Considerations
DBCTL Related Problems

⚠ **DBCTL Related Problems**

- **Issue IMS /DISPLAY ACTIVE and /DISPLAY CCTL commands, multiple times.**

  - ▶ **/DIS ACTIVE**

  - ▶ **/DIS CCTL ALL**

  - ▶ **/DIS CCTL cctlname**

- **Set the AP portion of the CICS trace to level 1-2.**

- **Set the FC (FILE CONTROL) portion of the CICS trace to level 1-2.**

- **Take a SVC dump using one of the methods discussed earlier in the presentation with related IMS regions, especially the CCTL regions.**

Specific Environment Considerations
DC Related Problems

⚠ **Problems involving Data Communications**

- **Issue IMS DISPLAY NODE x command.**

  ► **/DIS NODE nodename**

- **Turn on IMS NODE trace. Data will be captured in the IMS TYPE6701 log record. Print records using IMS utility programs DFSERA10/DFSERA30.**

  ► **/TRA SET ON NODE nodename**

- **Turn on the VTAM Buffer Trace and VTAM Internal Trace to complement the IMS NODE trace. Note: GTF must be active with the USR option.**

  ► **F NET,TRACE,TYPE=BUF,ID=nodename**

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

- **Take a SVC dump using one of the methods discussed earlier in the presentation with related IMS regions - especially VTAM.**

Specific Environment Considerations
APPC Related Problems

△ **Problems involving APPC**

- **Turn on the IMS LUMI Trace to the external trace dataset.**

  ► **/TRACE SET ON TABLE LUMI OPTION LOG**
  ► **/TRACE SET ON LUNAME XXXXXXX INPUT**
  ► **/TRACE SET ON LUNAME XXXXXXX OUTPUT**
    – **(XXXXXXX is the partner LU)**

- **Turn on the VTAM Buffer Trace and VTAM Internal Trace to complement the IMS LUMI trace. Note: GTF must be active with the USR option.**

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

- **Take a SVC dump using one of the methods discussed earlier in the presentation with related IMS regions - especially VTAM and the APPC regions.**

Specific Environment Considerations
APPC Related Problems Continued

- **Turn on the program trace for TPPCB DL/1 calls.**
  - ▸ **/TRACE SET ON PROGRAM pppppppp**
    - – **pppppppp is the program name of the application.**

- **Turn on the MVS APPC component trace.**
  - ▸ **TRACE CT,ON,200K,COMP=SYSAPPC**
    - – **nn,OPTIONS=(GLOBAL),END**

- **When the problem has been recreated, stop the CTRACE.**
  - ▸ **TRACE CT,OFF,COMP=SYSAPPC**
  - ▸ **APPC component trace sends its trace buffers to a SYS1.DUMP dataset.**

- **The following IPCS commands can be used to format the trace:**
  - ▸ **CTRACE COMP SYSAPPC SHORT - For one line entries**
  - ▸ **CTRACE COMP SYSAPPC FULL   - Summary of each entry**

Specific Environment Considerations Database Problems

⚠ **For problems in the database arena, obtain**

- **Damaged database dataset.**

- **Database Image copy of broken database in state prior to damage.**

- **Image Copy of logically related databases.**

- **IMS OLDS from all data sharing IMS subsystems.**

  ► **Save to last good database image copy of damaged database.**

- **If possible, and not already set, use IMS command and save output:**

  ► **/TRA SET ON TABLE nnnn OPTION LOG**

    – **Where nnnn alternately = DLI and LOCK**

- **SYSOUT from the Pointer Checker broken database.**

- **SYSOUT from batch jobs that accessed the damaged database.**

Specific Environment Considerations Database Problems, Cont...

⚠ **For problems in the database arena, obtain (Cont...)**

- **List.RECON and LIST.HISTORY DBD(broken database)**

- **SMF 60, 62, and 64 records from all data sharing systems**

  ► **Back to last good image copy of broken database.**

- **For VSAM datasets:**

  ► **IDCAMS LISTC for the broken VSAM dataset.**

  ► **IDCAMS DIAGNOSE and EXAMINE for the broken VSAM KSDS datasets.**

Preservation of CQS Documentation

⚠ **For an IMS/CQS environment, in addition to the preservation of standard documentation, consider implementing normal operating procedures to preserve the following documentation near the time of error.**

- **MVS Log Stream (For IMS Shared Queue related problems)**

- **Additional manual dump intervention.**

- **Most recent SRDS (Structure Recovery Data Set) for each dumped structure.**

MVS Log Stream

⚠ **The merged MVS log stream can be used to examine CQS log records.**

- **IEBGENER can be used along with the default log stream subsystem exit routine, IXGSEXIT, to copy the log records at time of failure for later analysis**

MVS Log Stream, JCL Example

```
//CQSCPYLG  JOB  USERID,USERID,MSGLEVEL=1,CLASS=K
//*****************************************************************
//*  This job copies a CQS log stream to a dataset (max 32K / record) *
//*                                                                *
//*    - Replace the DSN on the SYSUT1 card with your CQS logstream   *
//*      name.                                                     *
//*                                                                *
//*    - Replace the DSN on the SYSUT2 card with your desired output  *
//*      dataset name.  You may also need to adjust the space       *
//*      allocations, depending on the size of your logstream.      *
//*                                                                *
//* Changes:                                                       *
//*   Ø2/24/97 ben Creation                                        *
//*****************************************************************
//STEP1    EXEC  PGM=IEBGENER,REGION=1Ø24K
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSIN    DD  DUMMY
//SYSUT1   DD  DSN=SYSLOG.MSGQØ1.LOG,
//             SUBSYS=(LOGR,IXGSEXIT),
//             DCB=(BLKSIZE=3276Ø)
//SYSUT2   DD  DSN=CQS.LOG.COPY,
//             DISP=(NEW,KEEP,DELETE),
//             VOL=SER=USERØ5,
//             SPACE=(CYL,(2,1Ø)),
//             UNIT=SYSDA
```

CQS Additional Manual Dump Intervention

⚠ **IMS/CQS environment additional region dump considerations include:**

- **CQS Region**

- **Other CQS Clients with their related CQS regions.**

- **Above regions from the other IMSplex members.**

CQS Structure Dumps

⚠ **CQS structure dumps for each structure pair may be necessary to resolve the following types of problems:**

- **IMS wait problems**

- **CQS wait problems**

- **CQS restart problems**

- **CQS structure rebuild problems**

⚠ **The current SRDS (Structure Recovery Data Set) set should also be saved for each structure pair.**

CQS Structure Dump Contents

⚠ **CQS structure dumps should include:**

- **The primary structures**

- **The overflow structures**

- **The associated lock entries**

CQS Structure Dump Example

△ **Below is an example of the STRLIST for a dump:**

```
DUMPCOMM=(MSGQ Structure Dump)

R nn,
STRLIST=(STRNAME=imsmsgq01,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),
STRNAME=imsmsgq01oflw,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER)),END


 Where:
     imsmsgq01.................   is the main structure name
     imsmsgq01oflw............   is the overflow structure name
```

CQS Structure Dump Example

⚠ **For instances where it is decided that an IMS structure dump is necessary, it is possible that the MVS Logger function could be involved with the problem. Special MVS logger dump requirements follow along with the IMS CF structures:**

```
DUMP COMM=(CQS/LOGR Structure dump)

R vv,STRLIST=(STRNAME=imsmsgq01,LOCKE,
             (LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),CONT
R ww,STRNAME=imsmsgq01oflw,LOCKE,
             (LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),CONT
R xx,STRNAME=mvslogqmsg01,LOCKE,ACC=NOLIM,
             (LISTNUM=ALL,EDATA=UNSER,ADJ=CAPTURE)),CONT
R yy,JOBNAME=(IXGLOGR),DSPNAME=('IXGLOGR'.SYSLOGR0),CONT
R zz,SDATA=(COUPLE,ALLNUC,LPA,LSQA,PSA,RGN,SQA,TRT,CSA,GRSQ,XESDATA),END


 Where:
     imsmsgq01..................   is the main structure name
     imsmsgq01oflw.............   is the overflow structure name
     mvslogmsg01...............   is the associated logger structure name
```

IEADMCxx Example with Structures

△ **Create 3 SYS1.PARMLIB members called IEADMCIA, IEADMCIB, IEADMCIC:**

```
JOBNAME=(j1,j2,j3,j4,j5),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,GRSQ),
REMOTE=(SYSLIST=(*('j1','j2','j3','j4','j5'),SDATA)),END
```
  Where:
      j1 = IMS Control Region Jobname. j3 = DBRC Region Jobname.
      j2 = IMS DLI Region Jobname.   j4 = IRLM Region Jobname.
      j5 = IMS CQS Region.

```
JOBNAME=(j6,j7,j8,j9,j10),SDATA=(CSA,PSA,RGN,SQA,SUM,TRT,XESDATA),
REMOTE=(SYSLIST=(*('j6','j7','j8','j9','j10'),SDATA)),END
```
  Where:
      j6 = APPC Region.   j9 = Other CQS Client Region
      j7 = APPC Scheduler.   j10 = Other CQS Region.
      j8 = VTAM.
```
JOBNAME=(IXGLOGR),DSPNAME=('IXGLOGR'.SYSLOGR0),
SDATA=(COUPLE,ALLNUC,LPA,PSA,RGN,SQA,TRT,CSA,GRSQ,XESDATA)
STRLIST=(STRNAME=imsmsgq01,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),
STRNAME=imsmsgq01oflw,LOCKE,(LISTNUM=ALL,ADJ=CAPTURE,EDATA=UNSER),
STRNAME=mvslogqmsg01,LOCKE,ACC=NOLIM,(LISTNUM=ALL,
EDATA=UNSER,ADJ=CAPTURE)),END
```
  Where:
      imsmsgq01.................is the main structure name
      imsmsgq01oflw.............is the overflow structure name
      mvslogqmsg01..............is the associated logger structure

IEADMCxx DUMP Activation

⚠ **To request a dump from the IEADMCIA, IEADDMCIB and IEADMCIC parmlib members, enter the following MVS command:**

- **DUMP TITLE=(DUMP OF IMSplex and Partners),PARMLIB=(IA,IB,IC)**

⚠ **Three dump datasets will be created on the MVS image from which the command is entered.**

⚠ **Two dump datasets will be created on each image in the SYSPLEX matching the REMOTE specifications for the JOBNAMEs.**

- **NOTE: MVS logger feels that they normally need the MVS logger address space from the system which experiences the problem.**

CQS SRDS Preservation

⚠ **Save the most recent CQS SRDS (Structure Recovery Data Set) for each structure dumped.**

- ● **Use IDCAMS REPRO to accomplish this.**