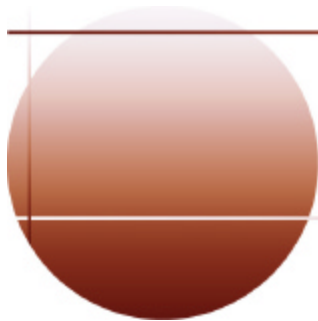# Session E58

Using **IPCS** with **IMS**

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IMS

technical conference

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Using IPCS With IMS Agenda

⚠ **This handout is reference material which outlines various IPCS commands which have been proven useful for IMS dump diagnostics.**

⚠ **Agenda**

- **IMS Dumps and IPCS**

- **IMS Formatting of Unformatted Machine-readable Dumps**

- **IMS Offline Dump Formatter**

- **IMS Interactive Dump Formatter**

- **Verifying Dump Contents**

- **Controlling IPCS for Easier Dump Analysis**

- **IPCS Storage Analysis Commands**

- **Miscellaneous IPCS Commands**

IMS and IPCS

IMS Dumps and IPCS

⚠ **IMS Dumps and IPCS**

- **IMS uses IPCS to aid in the formatting and analyzing of unformatted machine-readable dumps**

    - **SVC dumps**

    - **SYSMDUMP ABEND Dumps**

    - **Stand-alone dumps**

SVC Dumps

⚠ **SVC Dumps**

- ● **Received by issuing**

  - **SDUMP or SDUMPX macro in an authorized program**

  - **DUMP or SLIP command**

  - **Specifying SLIP or DUMP SYS1.PARMLIB members**

    - ▶ **IEASLPxx or IEADMCxx**

- ▶ **The following dump SDATA options should minimally be specified in the with IMS SVC dumps**

  - **SDUMP=(CSA,PSA,RGN,SQA,SUM,TRT)**

  - **Add to SDATA GRSQ for DUMP commands issued for wait conditions**

SYSMDUMPs Dumps

△ **SYSMDUMPs Dumps**

- **Received if SYSMDUMP DD statement in the region JCL and**

  - **ABEND macro used with DUMP**

  - **CALLRTM macro used with DUMP=YES**

  - **SETRP macro DUMP=YES**

  - **Internal SVC dump failure in the IMS control region**

- **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,RGN,SQA,SUM,TRT)**

Stand-Alone Dumps

△ **Stand-Alone Dumps**

- ● **A dump that is performed separately from normal system operations and does not require the system to be in a condition for normal operation**

  - **Disabled wait**

  - **Enabled wait**

  - **MVS System Loop**

  - **Partial MVS system hang**

- ● **To obtain a Stand-alone dump**

  - **Code/Assemble the AMDSADMP macro**

  - **Place the stand-alone dump program onto the residence volume in ready-to-load form.**

  - **Initialize and Run Stand-alone Dump program**

  - **See MVS Diagnosis: Tools and Service Aids, for further information**

IMS Formatting of Unformatted Machine-readable Dumps

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IMS Formatting of Unformatted Machine-readable Dumps

⚠ **IMS provides two interfaces to produce IMS formatting of unformatted machine-readable dumps**

- **IMS Offline Dump Formatter**

  - **The Offline Dump Formatter utility is invoked as a verb exit from the Interactive Problem Control System (IPCS).**

  - **IMS user control statement passed to the ODF to control dump format options**

- **IMS Interactive Dump Formatter**

  - **The Interactive Dump Formatter provides ISPF dialog support for offline dump formatter requests**

    - ▶ **Allows you to format your IMS dumps through a series of interactive menu-driven panels rather than by memorizing the Offline Dump Formatter commands or editing a DFSFRMAT dataset**

IMS Offline Dump Formatter

Installing the IMS Offline Dump Formatter

⚠ **Installing the IMS Offline Dump Formatter**

- **Add the Offline Dump Formatting module name to the Print Dump Exit Control Table in SYS1.PARMLIB member BLSCECTX**

  - **The IMS Offline Dump Formatting module should already be defined to MVS as part of MVS preconditioning for IMS.**

  - **If the definition is missing, the BLSCECTX member of SYS1.PARMLIB should be updated.**

    EXIT EP(DFSOFMD0) VERB(IMSDUMP) ABSTRACT('IMS analysis')

  - **See z/OS V1R4.0 MVS Initialization and Tuning Reference, SA22-7592-04 for more details on BLSCECT (The Formatting exits for dump and trace analysis for IPCS) and IMS IVP job IV_D202T for an example.**

Installing the IMS Offline Dump Formatter, continued

⚠ **Installing the IMS Offline Dump Formatter, continued**

- **Add IMS.SDFSRESL dataset to the TASKLIB DD**

  - **The TASKLIB concatenation is specified as part of the IPCS command invocation**

  - **If you do not want to add the entire library to the concatenation, concatenate a dataset containing both DFSABND0 and DFSOFMD0 load modules from the highest IMS version level, along with the alias modules from the IMS.SDFSRESL for lower level IMS versions that you wish to format**

    - **EXAMPLE with DFSABND0 from IMS V8, but providing format support for IMS V7:**

DFSABND0	DFSOFMD0
DFSAB810	DFSOF810
DFSAB710	DFSOF710

Invoking the IMS Offline Dump Formatter

⚠ **Invoking the IMS Offline Dump Formatter**

- **Start the IPCS Dialog from ISPF**

- **Initiate the formatter VERBX command**

  - **VERBX IMSDUMP 'jjjjjjjjj [,p] FMTIMS fmtimsoptions' ipcsoptions**

  - **Where**

    - ▸ <u>**jjjjjjjjj**</u> **= Job name or started task name of either the IMS CTL, DL/I, or the IMS batch address space.**

    - ▸ <u>**p**</u> **= ODF control parameters**

      - ◆ **R - Refresh dump formatter module to be loaded from current program libraries**

      - ◆ **H - Indicates HALFLINE, an optional parameter to request that the IMS dump formatter be limited to the width of a screen (that is, 80 characters per line)**

      - ◆ **N - No header, reduces header print volume**

      - ◆ **D - DEBUG , disables ODF ESTAE processing, allowing for dumps of ODF processing**

Invoking the IMS Offline Dump Formatter - Continued

⚠ **Invoking the IMS Offline Dump Formatter - Continued**

- **VERBX IMSDUMP 'jjjjjjjjjj [,p] FMTIMS fmtimsoptions' ipcsoptions**

  - **Where**

    - ▸ **FMTIMS - REQUIRED KEYWORD unless DFSFRMAT DD dataset is allocated and used to contain FMTIMS fmtimsoptions**

    - ▸ **fmtimsoptions- A subset of formatting options that describe the sections of the IMS dump to be formatted during the current pass of IPCS. These are listed on the following pages.**

    - ▸ **ipcsoptions - Valid IPCS VERBX command options**

      - ◆ **See the VERBEXIT Subcommand in z/OS V1R4.0 MVS IPCS Commands, SA22-7594-03**

Invoking the IMS Offline Dump Formatter - Continued

⚠ **Invoking the IMS Offline Dump Formatter - Continued**
- **fmtimsoptions - High-level, no additional arguments required**

– ALL or ALL,MIN	– MSDB or MSDB,MIN
– AUTO, or AUTO,MIN, or AUTO,SUM	– QM or QM,MIN
– CBT	– RESTART
– DB or DB,MIN	– SAVEAREA, or SAVEAREA,MIN or SAVEAREA,SUM
– DBRC	– SB or SB,MIN
– DC or DC,MIN	– SCD or SCD,MIN
– DEDB or DEDB,MIN	– SPST
– DISPATCH or DISPATCH,MIN	– SUBS
– EMH or EMH,MIN	– SUMMARY or SUMMARY,MIN
– LOG or LOG,MIN	– SYSTEM or SYSTEM,MIN
– LUM	– UTIL

Invoking the IMS Offline Dump Formatter - Continued

⚠ **Invoking the IMS Offline Dump Formatter - Continued**
- **fmtimsoptions - Low-level, additional arguments required as shown**

  - **CBTE,cbteid**

  - **CLB,address or CLB,nodename or CLB,lterm name or CLB, comm id**

  - **DPST,address or DPST, number or DPST,name**

  - **LLB,link number**

  - **LUB,lu name**

  - **POOL,poolid or POOL,poolid,MIN**

  - **SAP,sapaddr or SAP,ecbaddr**

  - **SYSPST,system pst address or SYSPST,system pst name**

  - **TRACE,name or TRACE,name,MIN**

IMS Interactive Dump Formatter

–

Installing the IMS Interactive Dump Formatter

⚠ **Installing the IMS Interactive Dump Formatter**

- **Add the following datasets to the associated DD statements used in the IPCS invocation**

  - **SYSPROC DD**

    ▸ **IMS.SDFSCLST - CLISTs**

    ▸ **IMS.SDFSEXEC - REXX EXEC**

  - **ISPMLIB DD**

    ▸ **IMS.SDFSMLIB - Messages**

  - **ISPPLIB DD**

    ▸ **IMS.SDFSPLIB - Panels**

  - **ISPTLIB DD**

    ▸ **IMS.SDFSTLIB - Tables**

Installing the IMS Interactive Dump Formatter, Continued

⚠ **Installing the IMS Interactive Dump Formatter, Continued**

- **Add the following datasets to the associated DD statements used in the IPCS invocation**

  - **IPCSPARM DD**

    - ► **IMS.SDFSRESL**

      - ◆ **If you prefer to create a smaller PDF, the only member used is**

        - * **DFSIPCSP**

  - **TASKLIB**

    - ► **IMS.SDFSRESL**

      - ◆ **If you prefer to create a smaller PDF, only members used are**

        - * **DFSABND0 DFSABvvv DFSOFMD0 DFSOFvvv**

  - **See z/OS V1R4.0 MVS IPCS Customization, SA22-7595-02**

Invoking the IMS Interactive Dump Formatter

△ **Invoking the IMS Interactive Dump Formatter**

- ● **Begin an IPCS dialog**
- ● **Select Option 0 (DEFAULTS)**

```
------------------- z/OS 01.02.00 IPCS PRIMARY OPTION MENU ----------
OPTION  ===> 0_
                                                         ***********
   0   DEFAULTS     - Specify default dump and options  * USERID  -
   1   BROWSE       - Browse dump data set               * DATE    -
   2   ANALYSIS     - Analyze dump contents              * JULIAN  -
   3   UTILITY      - Perform utility functions          * TIME    -
   4   INVENTORY    - Inventory of problem data          * PREFIX  -
   5   SUBMIT       - Submit problem analysis job to batch * TERMINAL-
   6   COMMAND      - Enter subcommand, CLIST or REXX exec * PF KEYS -
   T   TUTORIAL     - Learn how to use the IPCS dialog   ***********
   X   EXIT         - Terminate using log and list defaults

Enter END command to terminate IPCS dialog
```

Invoking the IMS Interactive Dump Formatter, Continued

⬗ **Invoking the IMS Interactive Dump Formatter, Continued**

- ● **Specify the dump dataset name**

```
------------------------ IPCS Default Values -------------------------
Command ===>

  You may change any of the defaults listed below.  The defaults shown be
  any changes are LOCAL.  Change scope to GLOBAL to display global defaul

  Scope    ==> LOCAL    (LOCAL, GLOBAL, or BOTH)

  If you change the Source default, IPCS will display the current default
  Address Space for the new source and will ignore any data entered in
  the Address Space field.

  Source  ==> DSNAME('M030776.ABEND0C4.IMS810.DUMP')
  Address Space    ==>
  Message Routing ==> NOPRINT TERMINAL
  Message Control ==> NOCONFIRM VERIFY FLAG(TERMINATING)
  Display Content ==> NOMACHINE REMARK REQUEST STORAGE NOSYMBOL

Press ENTER to update defaults.
```

Invoking the IMS Interactive Dump Formatter, Continued

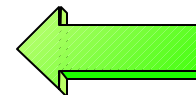⬚ **Invoking the IMS Interactive Dump Formatter, Continued**

- ● **Select option 2 (Analysis)**

```
------------------- z/OS 01.02.00 IPCS PRIMARY OPTION "LEFT     " is no
OPTION   ===> 2_                                                  ***********
   0   DEFAULTS      - Specify default dump and options          * USERID   -
   1   BROWSE        - Browse dump data set                      * DATE     -
   2   ANALYSIS      - Analyze dump contents                     * JULIAN   -
   3   UTILITY       - Perform utility functions                 * TIME     -
   4   INVENTORY     - Inventory of problem data                 * PREFIX   -
   5   SUBMIT        - Submit problem analysis job to batch      * TERMINAL-
   6   COMMAND       - Enter subcommand, CLIST or REXX exec      * PF KEYS -
   T   TUTORIAL      - Learn how to use the IPCS dialog          ***********
   X   EXIT          - Terminate using log and list defaults

Enter END command to terminate IPCS dialog
```
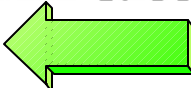
Invoking the IMS Interactive Dump Formatter, Continued

△ **Invoking the IMS Interactive Dump Formatter, Continued**

- ● **Select option 6 (Component)**

```
------------------- IPCS MVS ANALYSIS OF DUMP CONTENTS -------------
OPTION  ===> 6_

To display information, specify the corresponding option number.

    1   SYMPTOMS      - Symptoms                        ************
    2   STATUS        - System environment summary      * USERID  -
    3   WORKSHEET     - System environment worksheet    * DATE    -
    4   SUMMARY       - Address spaces and tasks        * JULIAN  -
    5   CONTENTION    - Resource contention             * TIME    -
    6   COMPONENT     - MVS component data              * PREFIX  -
    7   TRACES        - Trace formatting                * TERMINAL-
                                                        * PF KEYS -
                                                        ************

Enter END command to terminate MVS dump analysis.
```

Invoking the IMS Interactive Dump Formatter, Continued

△ **Invoking the IMS Interactive Dump Formatter, Continued**

● **Select DFSAAMPR (IMS Interactive Dump Formatter)**

```
------------------- IPCS MVS DUMP COMPONENT DATA ANALYSIS ----------------
OPTION ===>                                                  SCROLL ===>

To display information, specify "S option name" or enter S to the left
of the option desired.  Enter ? to the left of an option to display
help regarding the component support.

S Name      Abstract
_ CTRACE    Component trace summary
_ DAEDATA   DAE header data
_ DB2DATA   DB2 analysis
S DFSAAMPR  IMS Interactive Dump Formatter          ⬅
_ DIVDATA   Data in virtual storage
_ DLFDATA   Data Lookaside Facility data
_ DLFTRACE  Data Lookaside Facility trace
_ ELXDATA   IMS Transport Manager Formatting
_ GRSDATA   ENQ/DEQ resources
_ ILMDATA   License manager data
_ IOSCHECK  Active input/output requests
```
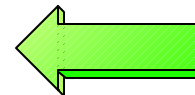
Invoking the IMS Interactive Dump Formatter, Continued

⟁ **Invoking the IMS Interactive Dump Formatter, Continued**

   ● **Select Option 0 (INIT) to initialize the dump dataset**

```
-------------------------- IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION  ===> 0_

   0   INIT        - IMS formatting initialization and content summary
   1   BROWSE      - Browse Dump dataset                    *************
   2   HI-LEVEL    - IMS Component level formatting          *USERID   - M
   3   LOW-LEVEL   - IMS ITASK level formatting              *DATE     - 0
   4   ANALYSIS    - IMS dump analysis                       *JULIAN   - 0
   5   USER        - IMS user formatting routines            *TIME     - 1
   6   OTHER COMP  - Other IMS components (BPE, CQS...)       *PREFIX   - M
   7   OTHER PROD  - Other IMS-related products              *TERMINAL- 3
   E   EDA         - IMS Enhanced Dump Analysis              *PF KEYS -
   T   TUTORIAL    - IMS dump formatting tutorial            *************
   X   EXIT        - Exit IMS dump formatting
Enter END or RETURN command to terminate IMS component formatting.
Use PFKeys to scroll up and down if needed.
```

Invoking the IMS Interactive Dump Formatter, Continued

- Invoking the IMS Interactive Dump Formatter, Continued
  - Enter the IMS Control or DLI region jobname, then press <Enter>
  - A series of informational panels will appear as the environment initializes. Exit the panels with PF3 until returning to IMS DUMP CONTENT STATUS AND CONTROL

```
-------------------- IMS DUMP CONTENT STATUS AND CONTROL  -----------
COMMAND ===>
 YOU MUST PROVIDE CTL OR DLI JOBNAME FOR IMS FORMATTING
   Enter the IMS CTL/BATCH or DL/I jobname to cause the IMS symbols to
   be set for this dump. Request subsystem list for possible IMS names.

N <==== IMS SUBSYSTEM LIST DESIRED? (Y or N)
N <==== FORMATTER REFRESH?          (Y or N)


          JOBNAME          ID          ASID          DUMPED?
------------------------------------------------------------------------
 CTL      IMS1_
 DL/I
 DBRC
 IRLM
 TMS


 ABEND CODE =  SYS                    USER
 MODULE     =
```
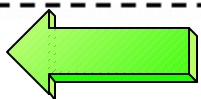
Invoking the IMS Interactive Dump Formatter, Continued

⬙ **Invoking the IMS Interactive Dump Formatter, Continued**

 ● **Return to the IMS DUMP FORMATTING PRIMARY MENU using PF3**

```
------------------- IMS DUMP CONTENT STATUS AND CONTROL -----------
COMMAND ===>

   Enter the IMS CTL/BATCH or DL/I jobname to cause the IMS symbols to
   be set for this dump. Request subsystem list for possible IMS names.

N <==== IMS SUBSYSTEM LIST DESIRED? (Y or N)
N <==== FORMATTER REFRESH?          (Y or N)

           JOBNAME         ID           ASID         DUMPED?
   --------------------------------------------------------------------
   CTL     IMS1            IMS1         002D           YES
   DL/I    DLIRCSAE                     0062           YES
   DBRC    DBRRCSAE                     0165           YES
   IRLM    N/A             N/A          N/A            N/A
   TMS

   ABEND CODE =  SYS                    USER
   MODULE     =
```

Invoking the IMS Interactive Dump Formatter, Continued

⚠ **Invoking the IMS Interactive Dump Formatter, Continued**

- **You can now use the IMS Interactive dump formatter to format IMS control blocks**

```
--------------------- IMS DUMP FORMATTING PRIMARY MENU -------------
OPTION  ===> _

    0   INIT         - IMS formatting initialization and content summary
    1   BROWSE       - Browse Dump dataset                    *************
    2   HI-LEVEL     - IMS Component level formatting         *USERID  - MC
    3   LOW-LEVEL    - IMS ITASK level formatting             *DATE    - 03
    4   ANALYSIS     - IMS dump analysis                      *JULIAN  - 03
    5   USER         - IMS user formatting routines           *TIME    - 16
    6   OTHER COMP   - Other IMS components (BPE, CQS...)      *PREFIX  - MC
    7   OTHER PROD   - Other IMS-related products             *TERMINAL- 32
    E   EDA          - IMS Enhanced Dump Analysis             *PF KEYS -
    T   TUTORIAL     - IMS dump formatting tutorial           *************
    X   EXIT         - Exit IMS dump formatting
 Enter END or RETURN command to terminate IMS component formatting.
 Use PFKeys to scroll up and down if needed.
```

Invoking the IMS Interactive Dump Formatter, Continued

⟁ **Invoking the IMS Interactive Dump Formatter, Continued**

  ● **Option 2 (HI-LEVEL) provides the high level IMS dump format options**

```
------------------------ IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION  ===> 2_

    0   INIT        - IMS formatting initialization and content summary
    1   BROWSE      - Browse Dump dataset                    *************
    2   HI-LEVEL    - IMS Component level formatting          *USERID  - M
    3   LOW-LEVEL   - IMS ITASK level formatting              *DATE    - 0
    4   ANALYSIS    - IMS dump analysis                       *JULIAN  - 0
    5   USER        - IMS user formatting routines            *TIME    - 1
    6   OTHER COMP  - Other IMS components (BPE, CQS...)       *PREFIX  - M
    7   OTHER PROD  - Other IMS-related products              *TERMINAL- 3
    E   EDA         - IMS Enhanced Dump Analysis              *PF KEYS -
    T   TUTORIAL    - IMS dump formatting tutorial            *************
    X   EXIT        - Exit IMS dump formatting
  Enter END or RETURN command to terminate IMS component formatting.
  Use PFKeys to scroll up and down if needed.
```

IMS Interactive Dump Formatter - High Level Options

△ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL)**

- **These are the various high-level <u>fmtimsoptions</u> and control parameters available from the Offline Dump Formatter**

```
------------------- IMS HIGH LEVEL DUMP FORMATTING OPTIONS  Row 1 to 1
Command ===>                                                 Scroll ==

N <====SPOOL OUTPUT? (Y or N)        N <====REFRESH FORMATTER? (Y or N)
        S = select   M = select,min      select choice(s) and hit enter
                                          to process or UP/DOWN to scroll

Additional IMS format requests===>


Cmd  Option          Description
---------------------------------------------------------------------------
 _     AUTO          Internally determined options (by failing ITASK type)
 _     ALL           All high level IMS dump formatting options
 _     SUMMARY       PSW, regs, SAP, failing ITASK blocks at time of abend
 _     SCD           SCD, SLX, FP ESCD, scheduler sequence queues
 _     SAVEAREA      SAP, savearea, ECB prefix, UEHB  (sorted by DSPNO)
 _     DISPATCH      Dispatcher work areas, Dispatcher and Latch traces
 _     SPST          System PSTs and subordinate blocks
 _     RESTART       CHKPT ID table, SIDX, LCRE, RPST, RRE, EQEL, IEEQE, FRB
 _     LOG           LCD, log buffer prefixes, log buffers (OLDS and MON)
 _     DB            DDIRs, PDIRs, intent list, DLI/LOCK traces, DPSTs, DBT
```

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IMS Interactive Dump Formatter - High Level Options, Continued

△ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL), Continued**

● **These are the various high-level fmtimsoptions and control parameters available from the Offline Dump Formatter**

```
------------------------ IMS HIGH LEVEL DUMP FORMATTING OPTIONS Row 11 to 23
Command ===>                                               Scroll ===>


N <====SPOOL OUTPUT? (Y or N)          N <====REFRESH FORMATTER? (Y or N)
      S = select    M = select,min       select choice(s) and hit enter
                                          to process or UP/DOWN to scroll

Additional IMS format requests===>


Cmd  Option           Description
---------------------------------------------------------------------------
 _    DEDB            ALDS, DMCB, DMAC, XCRB, SRB, ESRB, FPT blocks
 _    MSDB            BHDR, Main storage databases
 _    DC              CLB, LLB, VTCB, CTB, CNT, CTT, SPQB, LGND, USRD
 _    EMH             RCTE, BALG, EMHB
 _    QM              QPOOL, QMGR hash table, QBFPRF, Queue buffers
 _    UTIL            Partial reorg blocks
 _    SUBS            External subsystem blocks and trace           _
 _    CBT             Control block table
 _    SDE             Storage Descriptor Element Blocks and Storage
 _    SB              Sequential buffering control block formatting
```

IMS Interactive Dump Formatter - High Level Options, Continued

⚠ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL), Continued**

- **These are the various high-level <u>fmtimsoptions</u> and control parameters available from the Offline Dump Formatter**

```
------------------- IMS HIGH LEVEL DUMP FORMATTING OPTIONS Row 24 to 30
Command ===> _                                          Scroll ===>


N <====SPOOL OUTPUT? (Y or N)        N <====REFRESH FORMATTER? (Y or N)
     S = select   M = select,min        select choice(s) and hit enter
                                         to process or UP/DOWN to scroll

Additional IMS format requests===>


Cmd  Option            Description
-------------------------------------------------------------------------
_      LR          Log router trace and control blocks
_      TMS         Transport manager control blocks
_      TMSC        Transport manager component dump formatting
_      AOI         Automated Operator Interface (Directed Message Manager)
_      OTMA        Open TM Access
_      DBRM        Database Recovery Manager
_      SMBS        All SMBs
******************************** Bottom of data ********************************
```

IMS Interactive Dump Formatter - High Level Options - DISPATCH

⚠ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL),**

- **Notable high level dump format options**
  - **DISPATCH**

```
------------------- IMS HIGH LEVEL DUMP FORMATTING OPTIONS  Row 1 to 13
Command ===>                                               Scroll ===>


N <====SPOOL OUTPUT? (Y or N)        N <====REFRESH FORMATTER? (Y or N)
       S = select   M = select,min     select choice(s) and hit enter
                                        to process or UP/DOWN to scroll

Additional IMS format requests===>


Cmd  Option            Description
------------------------------------------------------------------------
_    AUTO         Internally determined options (by failing ITASK type)
_    ALL          All high level IMS dump formatting options
_    SUMMARY      PSW, regs, SAP, failing ITASK blocks at time of abend
_    SCD          SCD, SLX, FP ESCD, scheduler sequence queues
_    SAVEAREA     SAP, savearea, ECB prefix, UEHB  (sorted by DSPNO)
S    DISPATCH     Dispatcher work areas, Dispatcher and Latch traces
=    SPST         System PSTs and subordinate blocks
_    RESTART      CHKPT ID table, SIDX, LCRE, RPST, RRE, EQEL, IEEQE, FRB
```

IMS Interactive Dump Formatter - High Level Options - DISPATCH, Continued

- ◬ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL)**
  - ● **Notable high level dump format options - DISPATCH, continued**
    - – **RESUMED/SUSPENDED, ASIDS, CECB, TCB**

```
IPCS OUTPUT STREAM ------------------------------------- FOUND: LINE 3??
Command ===>                                              SCROLL    =>

 *** CTL TASK DISPATCHER WORK AREA ***        *** THIS TCB IS RESUMED ***


 IDSPWRK SECTION 1
 SECT1 AT 0AE67590
        0000          WTITL  C3E3D340   VSSAV  00??8510   WRKA2  0AE58180
        000C          DSVH1  0AB?CE30   ICOD1  ??A909B    DPXB   00CA9090
        0018          RESV   0??00000   QPOST  ?00361A0   QREDY  0AE67650
        0024          QPRCR  ?B95F30    CECB   0BEE06F0   ASCB   00FA6B80
        0030          ASIDS  002D002D   SCD1   00CC2840   CTRL1  00070002
        003C          PRB    00781AF0    TCB   007ABB60   TCBTB  0AC22100
        0048          RESV   00000000   RESV   00000000   RESV   00000000
        0054          RPSTN  00000000   RPST   00000000   ITCNT  0000003E
        0060          DPCNT  000000EE   CTRL2  ??0001E    HCR3   0140002D
        006C          HCR4   0003002D    CR3   0140002D    CR4   0003002D
        0078          DSPX   03010000   SMASK  40408000
     SRB/PARM AT 0AE67610
      00080   E2D9C240 00000000 00FA6B80 0000002D   *SRB ......,....*
```

34

IMS Interactive Dump Formatter - High Level Options - DISPATCH, Continued

⚠ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL),**

- **Notable high level dump format options - DISPATCH, continued**
  - **Time of last dispatch**

```
IPCS OUTPUT STREAM ---------------------------------------- Line 361 Cols
Command ===> _                                              SCROLL ===>
   STATISTICS SECT:
      00D8           STCK    B9C22505  STCK    41A28803  ACTIME 00000035
      00E4           ACTIME  41713FAF  STCKST  B9C2234A  STCKST 5082DB40
      00F0           STCKCU  B9C22505  STCKCU  4027CE03  IMSTIM 00000035
      00FC           IMSTIM  4165AF6F  CPUTIM  00000000  CPUTIM 43E065FC
      0108           #SUSP   00000085  #WRTCB  00000000
```

IMS Interactive Dump Formatter - High Level Options - SAVEAREA

⍓ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL),**

● **Notable high level dump format options**

– **SAVEAREA- SAPS (Save Area Prefixes)/saveareas sorted in desc dispatch order**

```
-------------------- IMS HIGH LEVEL DUMP FORMATTING OPTIONS  Row 1 to 13
Command ===>                                                Scroll ===>


N <====SPOOL OUTPUT? (Y or N)        N <====REFRESH FORMATTER? (Y or N)
        S = select    M = select,min      select choice(s) and hit enter
                                           to process or UP/DOWN to scroll

Additional IMS format requests===>


Cmd  Option          Description
-----------------------------------------------------------------------------
_     AUTO           Internally determined options (by failing ITASK type)
_     ALL            All high level IMS dump formatting options
_     SUMMARY        PSW, regs, SAP, failing ITASK blocks at time of abend
_     SCD            SCD, SLX, FP ESCD, scheduler sequence queues
S     SAVEAREA       SAP, savearea, ECB prefix, UEHB  (sorted by DSPNO)
_     DISPATCH       Dispatcher work areas, Dispatcher and Latch traces
_     SPST           System PSTs and subordinate blocks
_     RESTART        CHKPT ID table, SIDX, LCRE, RPST, RRE, EQEL, IEEQE, FRB
_     LOG            LCD, log buffer prefixes, log buffers (OLDS and MON)
_     DB             DDIRs, PDIRs, intent list, DLI/LOCK traces, DPSTs, DBT
```

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IMS Interactive Dump Formatter - High Level Options - SAVEAREA, Continued

⚠ **Invoking the IMS Interactive Dump Formatter, Option 2 (HI-LEVEL),**

- **Notable high level dump format options - SAVEAREA, continued**
  - **SAPS (Save Area Prefixes)/saveareas sorted in desc dispatch order**
  - **For wait/Loop analysis**
    - ▶ **Enter Command: F ***END - Position to oldest entries**

```
IPCS OUTPUT STREAM --------------------------------------------------------------
Command ===> F ***END_                                           SCROLL ===>

 ***END OF SORTED SAP FORMATTING (A C T I V E / W A I T I N G) ***

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
       END OF IMS FORMATTED DUMP
  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *


 ***************************** END OF DATA ***********************************
```

IMS Interactive Dump Formatter - High Level Options - SAVEAREA, Continued

- **Notable high level dump format options - SAVEAREA, continued**
  - **For wait/Loop analysis - To find previous ACTIVE SAP:**
    - ▶ **Enter Command: F ' **** ' PREV;RFIND;F '*SAVE';DOWN 1;RETRIEVE**

```
IPCS OUTPUT STREAM ------------------------------------------------------
Command ===> F '  **** ' PREV;RFIND;F '*SAVE';DOWN 1;RETRIEVE_        ===>
 ***SAVE AREA SET***


 EP    DFSCLM20+20021212+17.42+810PQ62156 A
 R14-R12: 00000534
 SA   0AE6A540       WD1 8AEEA3C0       HSA 80000000       LSA 0AE6A5C8
                     RET 8AB96424       EPA 0ABA4210        R0 00CC2840
                      R1 0AE6A504        R2 00000001        R3 00000001
                      R4 0AE67040        R5 00000004        R6 0AE67100
                      R7 0AE6A504        R8 0AE6A4E4        R9 0AE6A984
                     R10 0AEEA3C0       R11 00CC2840       R12 0AB95EF0


 EP    DFSIWAIT
 R14-R12: 000000B8        R14-EPA: 000000B8
 SA   0AE6A5C8       WD1 00000000       HSA 0AE6A540       LSA 0AE6A650
                     RET 8ABA42C8       EPA 8AB974C6        R0 00000000
                      R1 0AE6A504        R2 00CC9AF8        R3 00000001
                      R4 0AE67040        R5 00000004        R6 0AE67100
                      R7 0AE6A504        R8 0AE6A4E4        R9 0AE6A504
                     R10 0AE6A4E0       R11 00CC2840       R12 0ABA4210
```
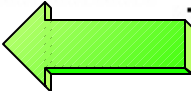
IMS Interactive Dump Formatter, Low Level Options

△ **IMS Interactive Dump Formatter, Low Level Options**

- ● **Option 3 (LOW-LEVEL) provides the low-level IMS dump format options**

```
-------------------- IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION  ===> 3_

   0   INIT        - IMS formatting initialization and content summary
   1   BROWSE      - Browse Dump dataset                      ************
   2   HI-LEVEL    - IMS Component level formatting           *USERID  - M
   3   LOW-LEVEL   - IMS ITASK level formatting               *DATE    - 0
   4   ANALYSIS    - IMS dump analysis                        *JULIAN  - 0
   5   USER        - IMS user formatting routines             *TIME    - 1
   6   OTHER COMP  - Other IMS components (BPE, CQS...)        *PREFIX  - M
   7   OTHER PROD  - Other IMS-related products               *TERMINAL- 3
   E   EDA         - IMS Enhanced Dump Analysis               *PF KEYS -
   T   TUTORIAL    - IMS dump formatting tutorial             ************
   X   EXIT        - Exit IMS dump formatting
Enter END or RETURN command to terminate IMS component formatting.
Use PFKeys to scroll up and down if needed.
```

IMS Interactive Dump Formatter, Low Level Options, Continued

⚠ **IMS Interactive Dump Formatter, Low Level Options, Continued**

- **These are the various low level <u>fmtimsoptions</u> and control parameters available from the Offline Dump Formatter**

```
-------------------- IMS LOW LEVEL DUMP FORMATTING OPTIONS - Row 1 to 12
COMMAND ===>                                            Scroll ===

N <===== SPOOL OUTPUT? (Y or N)    N <==== REFRESH FORMATTER? (Y or N)
         S or  M at left plus required ARGument value to select option.
         (Items marked *P* will prompt if ARG blank). UP/DOWN to scroll

Additional IMS formatter requests===>

Cmd  Option   Type       ARG         Argument description
v---------------------------vvvvvvvv-------------------------------------
_    CLB      ADDRESS                CLB/LLB address (hexadecimal)
_    CLB      NODE                   VTAM node name
_    CLB      LTERM                  IMS logical terminal name (CNT)
_    CLB      CID                    VTAM communication ID (hexadecimal)
_    CLB      LINE                   BTAM line number (decimal)
_    LLB      LINK                   MSC link number (decimal)
_    DPST     ADDRESS                Dependent region PST address (hexad
_    DPST     NUMBER                 Dependent region PST number (hexade
_    DPST     NAME                   Dependent region PST jobname
```

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IMS Interactive Dump Formatter, Low Level Options, Continued

△ **IMS Interactive Dump Formatter, Low Level Options, Continued**
  ● **Selecting and item with *P* next to the ARG field, and leaving the ARG value blank will display the available options**

```
------------------------ IMS LOW LEVEL DUMP FORMATTING OPTIONS   Row 10 to 18
COMMAND ===>                                                       Scroll ===>


N <===== SPOOL OUTPUT? (Y or N)    N <==== REFRESH FORMATTER? (Y or N)
          S or  M at left plus required ARGument value to select option.
          (Items marked *P* will prompt if ARG blank). UP/DOWN to scroll


Additional IMS formatter requests===>


Cmd  Option   Type      ARG           Argument description
V----------------------------VVVVVVVV---------------------------------------
_    SYSPST   ADDRESS                 System PST address
_    SYSPST   NAME                *P* System PST name
S    TRACE    NAME          _     *P* Trace table ID  (2 characters)
_    SAP      ADDRESS                 Savearea block address (hexadecimal)
_    SAP      ECBADR                  SAP's ECB address (hexadecimal)
_    OOL      NAME                *P* IMS storage pool name
_    CBTE     NAME                    Control Block Table name
_    LUB      NAME                    LU name
_    DTT      ADDRESS                 DTT address
```

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IMS Interactive Dump Formatter, Low Level Options, Continued

⬚ **IMS Interactive Dump Formatter, Low Level Options, Continued**
 ● **Trace menu is displayed after selecting TRACE with a blank ARG**

```
-------------------- IMS TRACE TABLE FORMATTING SELECTION - Row 1 to 14
COMMAND ===>                                            Scroll ===>


     Place an S in front of desired trace table type(s) and hit
     ENTER or END to process or UP/DOWN to scroll.


CMD Table    Trace       Trace Content Description
    ID       Name
v--------------------------------------------------------------------
_    ALL      ALL         All IMS Table Traces
_    FO       FORCE       Early Initialization Internal Trace
S    DS       DISP        IMS Dispatcher Activity
_    DL       DL/I        DL/I, DFP Interface, OSAM, and PI Activity
_    G        DLOG        IMS Logging Activity
_             FAST        Fast Path Activity
_    LA       LATC        Latch Manager Activity
_    DL       LOCK        Lock Manager Activity (alias for DL/I trace)
_    SC       SCHD        Transaction Scheduling Activity
_    SS       SUBS        External Subsystem Interface Activity
_    SM       STRG        Storage Manager Activity
_    IC       IDC0        Intercommunications Trace Table (CNXA+IDC)
```

IMS Interactive Dump Formatter, Low Level Options, Continued

△ **IMS Interactive Dump Formatter, Low Level Options, Continued**
- **IMS Dispatcher Trace Activity**

```
IPCS OUTPUT STREAM ----------------------------------------- Line 15 Cols
Command ===> _                                                SCROLL ===>
 ****************************************************************
 ***TRACE PRINTED FROM OLDEST TO MOST CURRENT ENTRY**
 ****************************************************************


   FUNCTION        WORD 0     WORD 1     WORD 2     WORD 3
                   WORD 4     WORD 5     WORD 6     WORD 7


 IWAIT             04057CB7   0AE2A060   00C3E2E3   8019D0D2
                   00CAA498   00000000   40080000   B1673C97   RST      CST
 IECB STORE        1B057CB8   0AE2A060   80CA90AB   00C3E2E3
                   00000000   00000000   00000000   B1673CA4   RST
 SUSPEND           27057CB9   00000000   002D002D   0AE676A0
                   007AB838   B9C223B1   673CBB46   B1673CBA   RST
 ITASK TERM        03027CD2   00053098   00000000   0AB31900
                   00000000   00000000   007ABB60   B16740D2   CTL
 IECB STORE        1B027CD3   00053098   80CA909B   00000000
                   00000000   00000000   00000000   B16740DC   CTL
 RE-DISPATCH       05027CD4   0004F738   40C3D8E2   40008000
                   80000000   8BC1AA64   00000000   B16740FC   CTL
```
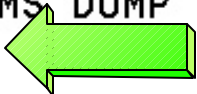
43

Verifying Dump Contents

Verify Dumped ASIDs

△ **Verify Dumped ASIDs**

  ● **Enter Command: IP CBF RTCT**

```
--------------------- IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION  ===> IP CBF RTCT

   0   INIT         - IMS formatting initialization and content summary
   1   BROWSE       - Browse Dump dataset                    ************
   2   HI-LEVEL     - IMS Component level formatting         *USERID  - M
   3   LOW-LEVEL    - IMS ITASK level formatting             *DATE    - 0
   4   ANALYSIS     - IMS dump analysis                      *JULIAN  - 0
   5   USER         - IMS user formatting routines           *TIME    - 1
   6   OTHER COMP   - Other IMS components (BPE, CQS...)      *PREFIX  - M
   7   OTHER PROD   - Other IMS-related products             *TERMINAL- 3
   E   EDA          - IMS Enhanced Dump Analysis             *PF KEYS -
   T   TUTORIAL     - IMS dump formatting tutorial           ************
   X   EXIT         - Exit IMS dump formatting
Enter END or RETURN command to terminate IMS component formatting.
Use PFKeys to scroll up and down if needed.
```

Verify Dumped ASIDs, Continued

⚠ **Verify Dumped ASIDs, Continued**

- ● **Find the ASTB - Address Space Table**
  - – **SDAS column will contain dumped ASIDs**
  - – **NOTE: This table will contain all zeros for a SYSMDUMP**

```
IPCS OUTPUT STREAM ---------------------------------------------------------
Command ===> IP CBF RTCT;F ASTB_                              SCROLL ===>
           ASTB


            SDAS  SDF4  SDF5

            ----  ----  ----
       001  002D  00    00
       002  0062  00    00
       003  0165  00    00
       004  0063  00    00
       005  0162  00    00
       006  0000  00    00
       007  0000  00    00
       008  0000  00    00
       009  0000  00    00
       010  0000  00    00
```

Verify Dumped ASIDs, Continued

△ **Verify Dumped ASIDs, Continued**

- ● **Format the dumped ASIDs from the ASTB**
  - – **Enter Command: IP SELECT ASID(X'2d',X'62',X'165',X'63',X'162')**

```
IPCS OUTPUT STREAM -------------------------------------------------
Command ===> ip select asid(x'2d',x'62',x'165',x'63',x'162')_ SCROLL
*************************** TOP OF DATA ***************************

  ASID JOBNAME  ASCBADDR  SELECTION CRITERIA
  ---- --------  --------  ------------------
  002D IMS1      00FA6B80  ASID
  0062 DLIRCSAE  00FB0200  ASID
  0063 SCI1      00FB0680  ASID
  0162 CQSRE1    00FB0380  ASID
  0165 DBRRCSAE  00FA4A00  ASID
*************************** END OF DATA ***************************
```
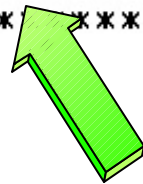
Verify SDUMP Options

⚠ **Verify SDUMP Options - Storage areas dumped.**

- **Enter Command: IP L 10?+23C?+9C**
  - **Gives address of SDUMP parm list**

```
IPCS OUTPUT STREAM ------------------------------------------------------
Command ===> IP L 10?+23C?+9C_                                   SCROLL
*************************** TOP OF DATA ***************************

LIST FB9770. ASID(X'002D') POSITION(X'+9C') LENGTH(X'10') AREA
00FB980C. 0232AE58 00000000 00000001 00FB7F18 |..............".|
*************************** END OF DATA ***************************
```

- **Use the SDUMP parameter list address to view the SDUMP specifications**
  - **Enter Command: IP CBF 0232AE58 STR(SDUMP) VIEW(FLAGS)**

Verify SDUMP Options, Continued

△ **Verify SDUMP Options, Continued**

 ● **Enter Command: IP CBF 0232AE58 STR(SDUMP) VIEW(FLAGS)**

    – **SDATA flags tell you what storage was dumped**

```
Command ===> IP CBF 0232AE58 STR(SDUMP) VIEW(FLAGS)_        SCROLL
   SDUMP_PL: 0232AE58

      ==> FLAGS SET IN SDUFLAG0:
       HDR/HDRADR specified.
       Set system non-dispatchable while dumping global storage.

      ==> FLAGS SET IN SDUFLAG1:
       SVC dump request.
       ASIDLIST specified.
       48+ byte parameter list.

      ==> FLAGS SET IN SDUSDATA:
       Dump all PSAs.              Dump LPA mod. for rgn.
       Dump current PSA.           Dump trace data.
       Dump the nucleus.           Dump CSA.
       Dump SQA.                   Dump SWA.
       Dump LSQA.                  Dump summary dump data.
       Dump rgn-private area.
```
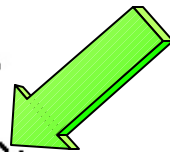
Verify Whether the SDUMP was Complete

⚠ **Verify Whether the SDUMP was Complete**

- ● **Enter Command: IP L E0. L(16) BLOCK(0)**
  - – **Partial dump bits - Mapped by MVS SDRSN DSECT**

```
IPCS OUTPUT STREAM ------------------------------------------- Line 0
Command ===> _                                                  SCROLL
 ****************************** TOP OF DATA ****************************

 LIST E0. BLOCK(0) LENGTH(X'10') AREA
 E0. LENGTH(X'10')==>All bytes contain X'00'
 ****************************** END OF DATA ****************************
```

- ● **If all bits are zeros, SDUMP was successfully captured**
- ● **If all bits are not zeros, use MVS SDRSN DSECT to interpret the bit settings**
  - – **See z/OS V1R4 MVS Data Areas, Vol 4, GA22-7584-03**

Verify Private Region Storage is Dumped

⚠ **Verify Private Region Storage is Dumped**

- ● **SDUMP SDATA may indicate private is dumped, but is private storage in the dump dataset?**

  – **To determine this, Select Option 1 (BROWSE)**

```
-------------------- IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION  ===> 1

   0   INIT        - IMS formatting initialization and content summary
   1   BROWSE      - Browse Dump dataset               ************
   2   HI-LEVEL    - IMS Component level formatting     *USERID  - MC
   3   LOW-LEVEL   - IMS ITASK level formatting         *DATE    - 0
   4   ANALYSIS    - IMS dump analysis                  *JULIAN  - 0
   5   USER        - IMS user formatting routines       *TIME    - 1
   6   OTHER COMP  - Other IMS components (BPE, CQS...)  *PREFIX  - MC
   7   OTHER PROD  - Other IMS-related products         *TERMINAL- 3
   E   EDA         - IMS Enhanced Dump Analysis         *PF KEYS -
   T   TUTORIAL    - IMS dump formatting tutorial       ************
   X   EXIT        - Exit IMS dump formatting
 Enter END or RETURN command to terminate IMS component formatting.
 Use PFKeys to scroll up and down if needed.
```

Verify Private Region Storage is Dumped, Continued

⚠ **Verify Private Region Storage is Dumped, Continued**

- **Select the beginning of user private x'6000' to determine if storage is present**

```
DSNAME('M030776.ABEND0C4.IMS810.DUMP') POINTERS   -----------------
Command ===>                                              SCROLL
ASID('002D') is the default address space
PT    Address     Address space                        Data type
S0001 00006000  ASID(X'002D')                          AREA
      Remarks:  IMS1 - Start of User Private
00002 00006000  ASID(X'0062')                          AREA
      Remarks:  DLIRCSAE - Start of User Private
00003 00006000  ASID(X'0063')                          AREA
      Remarks:  SCI1 - Start of User Private
00004 00006000  ASID(X'0162')                          AREA
      Remarks:  CQSRE1 - Start of User Private
00005 00006000  ASID(X'0163')                          AREA
      Remarks:  DBRRCSAE - Start of User Private
******************************** END OF POINTER STACK ********************
```

Verify Private Region Storage is Dumped, Continued

△ **Verify Private Region Storage is Dumped, Continued**

- ● **If storage is listed, indicates private storage is present**

```
ASID(X'002D') ADDRESS(6000.) STORAGE ---------------------------------------
Command ===> _                                           SCROLL ===> C
00006000    00000000    00000000    C4C6E2D9    E2D9F0F0   |........DFSRSR00 |
00006010    00006424    0000F348    00006024    00006074   |......3...-...-. |
00006020    00000001    D9E2D94D    D5D65D40    40404040   |....RSR(NO)      |
00006030.:603F.--All bytes contain X'40', C' '
00006040    40404040    40404040    40615C40    D9E2D940   |         /* RSR  |
00006050    C9E240D5    D6405C61    40404040    40404040   |IS NO */         |
```

- ● **If storage is not listed, indicates private storage is not present**

```
ASID(X'0163') ADDRESS(1000.) STORAGE ---------------------------------------
Command ===> _                                           SCROLL ===> C
00001000.:C97FFF.--Storage not available
00C98000    0FC4E2D7    00000000    00000000    00000000   |.DSP............ |
00C98010    00130000    0AE67590    800C81B8    00000000   |.....W....a..... |
00C98020    80CA909B    00054F0C    00C98040    00C9849A   |.......|..I. .Id.|
00C98030    40404040    40404040    00000000    00000000   |         ........|
00C98040    04520000    00000000    00000000    00000000   |................ |
```

What was the Reason for the Dump?
SVC DUMP

△ **What was the reason for the dump?**

- ● **Enter Command: IP LIST TITLE**

  - – **Displays dump title**

```
IPCS OUTPUT STREAM --------------------------------------------------IPCS
Command ===> ip list title_                                    SCROLL ===> CSR
 ****************************** TOP OF DATA ******************************

LIST 00. LITERAL LENGTH(X'64') CHARACTER
00000000 |  IMS1      ABEND SYS 0C4 USER 0000-010, DATE.TIME: 203.135218, CAL
00000040 |  LER=CTL , TCB=CTL, MODULE=DFSICLP0,P
 ****************************** END OF DATA ******************************
```

What was the Reason for the Dump? MVS SLIP Trap

⚠ **What was the reason for the dump?, Continued**

- ● **Enter Command: IP LIST TITLE - Dump title indicates SLIP**

```
IPCS OUTPUT STREAM  ------------------------------------------------------
Command ===>  IP LIST TITLE                                    SCROLL
_
 ***************************** TOP OF DATA *****************************


LIST 00. LITERAL LENGTH(X'11') CHARACTER
00000000 | SLIP DUMP ID=IMA2
 ***************************** END OF DATA *****************************
```

- ● **Enter Command: IP LIST SLIPTRAP**
  - − **Will show MVS SLIP specifications if used**

```
IPCS OUTPUT STREAM  ------------------------------------------------------
Command ===>  IP LIST SLIPTRAP_                             SCROLL ===> CSR
 ***************************** TOP OF DATA *****************************


LIST 00. LITERAL LENGTH(X'4A') CHARACTER
00000000 | SLIP SET,A=SVCD,COMP=U0711,JOBLIST=(IMSIMA2,RRS),ID=IMA2,DSPNAME |
00000040 | =('RRS'.*)                                                       |
 ***************************** END OF DATA *****************************
```
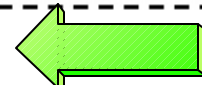
- ● **Enter Command: IP LIST TITLE - Dump title indicates SLIP**

What was the Reason for the Dump? MVS DUMP Command

⚠ **What was the reason for the dump?, Continued**

- ● **Enter Command: IP VERBX MTRACE**

  - – **Will show MVS DUMP command if used**

```
IPCS OUTPUT STREAM -------------------------------------------------------
Command ===> IP VERBX MTRACE;F 'DUMP CO                          SCROLL ===>

00000290   DUMP COMM=(CBAU2A04 HUNG)
00000090  *7652 IEE094D SPECIFY OPERAND(S) FOR DUMP COMMAND
00000081   +IBVERSG0> IBVERSG0 DPV6 LNV1 CIV3 10/12/01 09.46 @

00000090   DXR162I IRLF001 CYCLE NUMBER 0003474F PROCESSED FOR

00000081   ¢HEDED BY 600 MINUTES        TIME EXCEEDED BY 600 MINUTES
00000081   IS 00000081   IS2015I SDS2 COMMAND EXECUTED   'REPLY 7652 TEXT 05
            REPLY
00000281   R
00000090   IE 00000281   R 7652,JOBNAME=(IMSF,IMSF0203,IMDLIF,IMIRLF)
            00000090   IEE600I REPLY TO 7652 IS;JOBNAME=(IMSF,IMSF0203,IMDLIF
00000081   DM
00000081   ¢H 00000081   DMB604I DMSCSVCR PASSING DUMP TO IBM
```
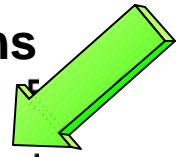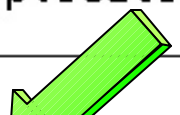
Controlling IPCS for Easier Dump Analysis

Use ISPF SPLIT to Create Multiple Logical Sessions

⚠ **ISPF SPLIT/SWAP allows you to view multiple logical screens while diagnosing**

- ● **Enter Command: SPLIT NEW - to create a new logical screen**
- ● **Enter Command: SWAP n - to swap to the desired logical screen**
- ● **Enter Command: SWAP LIST - to display Active ISPF Logical Sessions**

```
------------------------- IMS HIGH LEVEL DUMP FORMATTING OPTIONS - Row
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    Menu   Utilities   Compilers   Options   Status   Help
  _ ─────────────────────────── ISPF Task List ───────────────────────── _
                          Active ISPF Logical Sessions
0
0   .   Start a new screen                                          r ID .
1   .   Start a new application                                     e. . .
2       Application Name                                            minal.
3       _____               een. .
4       ID  Name         Panelid   Applid   Session Type            guage.
5       1*               ISR@PRIM  BLSG     3270                     l ID .
6   . _ 2                BLSPPRIM  BLSG     3270                      logon
7   .   3                BLSPPRIM  BLSG     3270                      prefi>
1   .   4-               DFSAALH0  BLSG     3270                     tem ID
1   .                                                                acct.
    .                                                               ease .
D   .
G
```

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Routing IPCS Output to a Dataset

△ **Route IPCS output to a dataset for editing**

△ **Use ISPF 3.2**

- **Choose dsname**
- **Enter "A" for allocate**
  - **Units=CYLS**
  - **Primary=10**
  - **2ndry=5**
  - **DirBlks=0**
  - **RecF=VBA**
  - **LRECL=132**
  - **BLKSZ= (leave blank)**

△ **Go to IPCS COMMAND Panel**

- **IP FREE FI(IPCSPRNT)**
- **TSO ALLOC FI(IPCSPRNT) DSN(dsname) SHR**
- **--- enter the IPCS Command for which output is desired -- <u>PRINT NOTERM</u>**
  - **Example: IP SUMMARY FORMAT PRINT NOTERM**
- **IP CLOSE PRINT**

IPCS Pointer Panel Commands

△ **IPCS Pointer Panel Commands**

  ● **Select Option 1 (BROWSE)**

```
---------------------- IMS DUMP FORMATTING PRIMARY MENU ------------
OPTION   ===> 1

    0   INIT        - IMS formatting initialization and content summary
    1   BROWSE      - Browse Dump dataset                ************
    2   HI-LEVEL    - IMS Component level formatting      *USERID   - M
    3   LOW-LEVEL   - IMS ITASK level formatting          *DATE     - 0
    4   ANALYSIS    - IMS dump analysis                   *JULIAN   - 0
    5   USER        - IMS user formatting routines        *TIME     - 0
    6   OTHER COMP  - Other IMS components (BPE, CQS...)   *PREFIX   - M
    7   OTHER PROD  - Other IMS-related products          *TERMINAL- 3
    E   EDA         - IMS Enhanced Dump Analysis          *PF KEYS -
    T   TUTORIAL    - IMS dump formatting tutorial        ************
    X   EXIT        - Exit IMS dump formatting
  Enter END or RETURN command to terminate IMS component formatting.
  Use PFKeys to scroll up and down if needed.
```

IPCS Pointer Panel Commands, Continued

△ **POINTERS Panel PTR line commands**
- **S - Browse the storage**
- **R - Repeat the current PTR entry**
- **F - Format the STRUCTURE control block**

```
DSNAME('IMSDUMP.X030802.Y170802.SJFEVMX.MADDIX') POINTERS   --------------
Command ===>                                                 SCROLL ===>
ASID(X'002D') is the default address space
PTR    Address    Address space                             Data type
S000  00000000    ASID(X'002D')                             AREA
      Remarks:
R0002 007ABB60    ASID(X'002D')                             STRUCTURE(Tcb)
      Remarks: IMS CTL TCB
00003 00781AF0    ASID(X'002D')                             STRUCTURE(Prb)
      Remarks: IMS CTL RB
00004 0078BB50    ASID(X'002D')                             STRUCTURE(Svrb)
      Remarks: IMS CTL RB
00005 00779130    ASID(X'002D')                             STRUCTURE(Prb)
      Remarks: IMS CTL Last RB
F0006 00770918    ASID(X'002D')                             STRUCTURE(Sdwa)
      Remarks: SDWA Describing ABEND
00007 00FCB8E0    ASID(X'0001')                             STRUCTURE(Cvt)
      Remarks: Communications Vector Table
****************************** END OF POINTER STACK ************************* 61
```

IPCS Pointer Panel Commands, Continued

△ **POINTERS Panel PTR line commands**
- **F - Format the STRUCTURE control block**
  - **Format example for SDWA**

```
IPCS OUTPUT STREAM ----------------------------------------------- Line 0 Cols
Command ===> _                                            SCROLL ===>
 *********************************** TOP OF DATA **********************************


  SDWA: 00770918
     +0000   PARM.....  0000AAC8   ABCC.....  840C4000   CTL1.....  FF740010
     +000C              00000000   CTL2.....  FF740010   00000000
             GRSV - GPRs at time of error
        0-3  00CC2840   0BBC8EDC   0BEE0714   0AE380B8
        4-7  0BEE0714   800D0208   000619C8   0BEE07F0
       8-11  0005FDF0   0BEE06F0   000619C8   00CC2840
      12-15  000D084C   0BE366B8   2003203F   00CC80D8
     +0058   NAME.....  00781AF0   00000000              EPA......  00000000
     +0064   IOBR.....  00000000
             EC1 -   PSW at time of error
   PSW=077C2000 800D0A60
       (Running in PRIMARY, key 7, AMODE 31, DAT ON)
       DISABLED FOR PER
     +0070   AEC1.....  00040010   20032000              EC2......  077C2000
     +007C              800D0A60   AEC2.....  00040010   20032000
```

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IPCS Storage Analysis Commands

IPCS Storage Analysis

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of storage conditions**
  - **Enter Command: IP VERBX VSMDATA 'ASIDLIST(dd) SUMMARY'**
    - **Where dd = Decimal ASID value**

```
IPCS OUTPUT STREAM ---------------------------------------------------
Command ===> IP VERBX VSMDATA 'ASIDLIST(210) SUMMARY'          SCROLL ===>
*************************** TOP OF DATA ***************************************


        VIRTUAL STORAGE MANAGEMENT DUMP FORMAT ROUTINE


        THE FOLLOWING KEYWORDS ARE IN EFFECT:
                CONTROLBLOCKS
                ASIDLIST
                GLOBAL
                SUMMARY
```
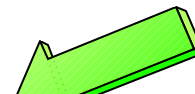
IPCS Storage Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of storage conditions**

- **Enter Command: F 'LOCAL STORAGE MAP'**

```
         L O C A L   S T O R A G E   D A T A   S U M M A R Y
        LOCAL STORAGE MAP

    _____
   |                                |80000000  <- TOP OF EXT. PRIVATE
   | Extended                       |
   | LSQA/SWA/229/230               |80000000  <- MAX EXT. USER REGION ADDRESS
   |_____|7CD90000  <- ELSQA BOTTOM
   |                                |
   | (Free Extended Storage)        |
   |_____|2BFA9000  <- EXT. USER REGION TOP
   |                                |
   | Extended User Region           |
   |_____|21900000  <- EXT. USER REGION START
   :                                :
   : Extended Global Storage        :
   =====================================<- 16M LINE
   : Global Storage                 :
   :_____:  700000  <- TOP OF PRIVATE
   |                                |
   | LSQA/SWA/229/230               |  700000  <- MAX USER REGION ADDRESS
   |_____|  621000  <- USER REGION TOP**
   |                                |
   |                                |
   |                                |
   |                                |
   |                                |
   | User Region                    |
   |_____|    6000  <- USER REGION START
   : System Storage                 :
   :_____:       0

**   User Region Top has hit bottom of LSQA
```

Abend878 RC10 (Out of virtual private) Example

IPCS Storage Analysis, Private Storage Analysis

△ **IPCS Storage analysis for ABEND878 or ABEND80A out of private storage**

- **Go to IPCS BROWSE mode POINTERS panel**
- **Enter Command: STACK nnnnnnnn ASID(X'aa')**
  - **Where nnnnnnnn = USER REGION TOP from Local Storage Map**
- **Select the PTR entry for nnnnnnn**

```
DSNAME('IMSDUMP.X030804.Y155720.SJFEVMX.MO▒▒▒▒') POINTERS  -------------
Command ===> STACK 00621000 ASID(X'D2')                      SCROLL ===>
ASID(X'00D2') is the default address space

PTR    Address    Address space                            Data type
00001  00000000   ASID(X'00D2')                            AREA
       Remarks:
S0002  00621000   ASID(X'00D2')                            AREA
       Remarks:
*******************************  END OF POINTER STACK  ************************
```

IPCS Storage Analysis,
Private Storage Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of private storage**

- **Scan backward (toward zeros) from User Region Top (00621000) to see if you can identify the storage**

  – **User Private allocated from the bottom up**

- **Continue scanning backward while attempting to spot a pattern**

```
ASID(X'00D2') ADDRESS(61FF50.) STORAGE -------------------------------------
Command ===> _                                        SCROLL ===> C
0061FF50.:62014F.--All bytes contain X'00'
00620150    C3C9D6D7   C9000000    0061CCC8    00000000 | CIOPI..../.H.... |
00620160.:62035F.--All bytes contain X'00'
00620360    00000000   00000000    C3C9D6D7    C9000000 | ........CIOPI... |
00620370    0061CCC8   00000000    00000000    00000000 | ./.H............ |
00620380.:62057F.--All bytes contain X'00'
00620580    C3C9D6D7   C9000000    0061CCC8    00000000 | CIOPI..../.H.... |
00620590.:62078F.--All bytes contain X'00'
00620790    00000000   00000000    C3C9D6D7    C9000000 | ........CIOPI... |
006207A0    0061CCC8   00000000    00000000    00000000 | ./.H............ |
006207B0.:6209AF.--All bytes contain X'00'
006209B0    C3C9D6D7   C9000000    0061CCC8    00000000 | CIOPI..../.H.... |
```

IPCS Storage Analysis,
Private Storage Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of private storage**

- ● **Enter Command: IP VERBX VSMDATA 'ASIDLIST(dd) DETAIL NOG'**
  - – **Where dd = Decimal ASID value**

```
IPCS OUTPUT STREAM -------------------------------------------------------
Command ===> IP VERBX VSMDATA 'ASIDLIST(210) DETAIL NOG'          SCROLL ===>
 ************************************ TOP OF DATA ***********************************


        VIRTUAL STORAGE MANAGEMENT DUMP FORMAT ROUTINE


        THE FOLLOWING KEYWORDS ARE IN EFFECT:
                CONTROLBLOCKS
                ASIDLIST
                NOGLOBAL
                DETAIL
```

IPCS Storage Analysis, Private Storage Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of private storage**
- **Enter Command: F ' 005F' - Finds VSM Descriptor Queue Elements**
  - **From Summary output: 621000 <- USER REGION TOP****
- **These storage allocation patterns may help you identify storage areas in BROWSE mode. In this case, the blocks start at x'5F0800' and x'5F3800' with a length of x'2800' bytes**

```
IPCS OUTPUT STREAM ------------------------------------------------------------
Command ===> F ' 005F'                                           SCROLL ==
            DQE AT ADDRESS 7D68A6B8
   +0000   NEXT..... 7D68A7F0   PREV..... 7D68A868   FFQE..... 7D68A7D8
   +000C   LFQE..... 7D68A7D8   AREA..... 005F0000   SIZE..... 00003000


            FQE AT ADDRESS 7D68A7D8
   +0000   AREA..... 005F0000   SIZE..... 00000800   NEXT..... 7D68A6B8
   +000C   PREV..... 7D68A6B8   DQE...... 7D68A6B8


         DQE AT ADDRESS 7D68A7F0
   +0000   NEXT..... 7D68A910   PREV..... 7D68A6B8   FFQE..... 7D68A898
   +000C   LFQE..... 7D68A898   AREA..... 005F3000   SIZE..... 00003000


            FQE AT ADDRESS 7D68A898
   +0000   AREA..... 005F3000   SIZE..... 00000800   NEXT..... 7D68A7F0
   +000C   PREV..... 7D68A7F0   DQE...... 7D68A7F0
```

Allocated Storage

Free Storage

IPCS Storage Analysis, CSA Analysis

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**

- **Go to IPCS BROWSE mode POINTERS panel**

- **Enter Command: STACK CSA**

- **Select the CSA PTR entry**

```
DSNAME('IMSDUMP.X030804.        20.SJFEVMX.MADDIX') POINTERS  -------------
Command ===> STACK CSA                                      SCROLL ===>
ASID(X'0001') is the default address space
PTR    Address    Address space                           Data type
00001  00000000   ASID(X'00D2')                           AREA
       Remarks:
S0002  00700000   ASID(X'0001')                           AREA(CSA)
       Remarks: Common system area
****************************** END OF POINTER STACK ***********************
```

IPCS Storage Analysis, CSA Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**
- **Scan forward from the first displayed address to see if you can identify the allocated storage**
  - **CSA Storage is allocated from the top down**
- **Continue scanning forward while attempting to spot a pattern**

```
ASID(X'0001') ADDRESS(5EC000.) STORAGE ----------------------------------------
Command ===>  _                                                SCROLL ===>
005EC000.:8FCFFF.--Storage not available
008FD000.:8FD1EF.--All bytes contain X'00'
008FD1F0    C3E2C3E7    01000000    008FD204    00000000    CSCX......K.....
008FD200    00000000    00000000    C2D4D7E3    C2D7C4C2    ........BMPTBPDB
008FD210    10F04C00    C3E2C3E7    01000000    008FD228    .0<.CSCX......K.
008FD220    00000000    00000000    00000000    C2D4D7E3    ............BMPT
008FD230    C2D7C4F0    10F04D00    C3E2C3E7    01000000    BPD0.0(.CSCX....
008FD240    008FD24C    00000000    00000000    006EF0C0    ..K<..........>0{
008FD250    C9D5C9E3    40404040    10F04E00    C3E2C3E7    INIT    .0+.CSCX
008FD260    01000000    008FD270    00000000    00000000    ......K.........
008FD270    006EF040    C9D5C9E3    40404040    10F04F00    .>0 INIT    .0|.
008FD280    C3E2C3E7    01000000    008FD294    00000000    CSCX......Km....
008FD290    00000000    00000000    D9E3C2C4    C4F9F5F5    ........RTBDD955
008FD2A0    10F05000    C3E2C3E7    01000000    008FD2B8    .0&.CSCX......K.
```

IPCS Storage Analysis, CSA Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**
- **Enter Command:**
  - **IP VERBX VSMDATA 'OWNCOMM DETAIL ALL SORTBY(TIME)' - and/or**
  - **IP VERBX VSMDATA 'OWNCOMM DETAIL ALL SORTBY(ADDRESS)'**
- **Using Time, Address, Length, Job Name, and Ret Addr - analyze patterns to determine the reason for the storage growth - Available if the MVS Common Storage Tracker was set on. See MVS Initialization and Tuning Guide**

```
ASID Job Name Id           St T Address  Length   Ret Addr MM/DD/YYYY HH:MM:SS CAUB     GQE
---- -------- --------     -- - -------- -------- -------- ---------- -------- -------- --------
0000 *SYSTEM* ........     Ac S 00904000 00001000 0144237C 07/16/2003 16:54:18 0204F480 16312E68
 Data ------> 0000001F 00904080 0000001F 00CE0000   *...... .........*
00D2 IMS$     JOB07312 Ac S 0091C010 00000018 1D79E426 07/16/2003 16:54:17 13CE85B0 11BAC760
 Data ------> 00B5EAE0 20E8E150 000000B0 E77000D2   *...\.Y.&....X..K*
010D IMS$     JOB07312 Ac S 0091C040 00000018 1D79E426 07/16/2003 16:54:15 12043B98 0F3BF220
 Data ------> 009BC0A0 20F76490 000000B0 E770010D   *..{...7......X...*
00B4 IMS$     JOB07312 Ac S 0091C058 00000018 1D79E426 07/16/2003 16:54:10 13AB93B8 0FC12B38
 Data ------> 00B7F5A0 20DD6120 000000B0 E77000B4   *..5.../.....X...*
01A9 IMS$     JOB07312 Ac S 0091C070 00000018 1D79E426 07/16/2003 16:53:58 12043E20 0D7689B8
 Data ------> 00B6E220 18F3DEB8 00001148 E77001A9   *..S..3......X..z*
010D IMS$     JOB07312 Ac S 0091C088 00000018 1D79E426 07/16/2003 16:53:55 12043B98 14165448
 Data ------> 0095B658 20F769C0 000000B0 E770010D   *.n...7.{....X...*
05EC IMS$     JOB07312 Ac S 0091C700 00000018 1D79E426 07/16/2003 16:53:47 1D6EF370 0FE20B20
 Data ------> 00B9E7F8 20DE2400 000000B0 E77005EC   *..X8........X...*
00FC IMS$     JOB07312 Ac S 0091C718 00000018 1D79E426 07/16/2003 16:53:38 13CE86D0 12F9F790
 Data ------> 0091C748 20C829F0 000000B0 E77000FC   *.jG..H.0....X...*
```
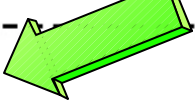
IPCS Storage Analysis, CSA Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**

- **Enter Command: IP VERBX VSMDATA 'NOASIDS DETAIL'**

```
IPCS OUTPUT STREAM -------------------------------------------------------------
Command ===> IP VERBX VSMDATA 'NOASIDS DETAIL'                    SCROLL ===>
 ******************************* TOP OF DATA ******************************:


          VIRTUAL STORAGE MANAGEMENT DUMP FORMAT ROUTINE


          THE FOLLOWING KEYWORDS ARE IN EFFECT:
                   CONTROLBLOCKS
                   GLOBAL
                   NOASIDS
                   DETAIL
```

IPCS Storage Analysis, CSA Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**
- **Enter Command: F ' 0090' - Finds VSM Descriptor Queue Elements**
  - **From BROWSE mode display analysis**
- **These storage allocation patterns may help you identify storage areas in BROWSE mode. Eyecatchers often exist at the top of control blocks**

```
IPCS OUTPUT STREAM ----------------------------------------------------------------
Command ===> F ' 0090'                                          SCROLL ===>
         DQE AT ADDRESS 18BCFE80
  +0000   NEXT..... 0F62D010   PREV..... 028ADA0C   FFQE..... 18BCFE80
  +000C   LFQE..... 18BCFE80   AREA..... 00901000   SIZE..... 00001000

         DQE AT ADDRESS 0F62D010
  +0000   NEXT..... 1C9E8148   PREV..... 18BCFE80   FFQE..... 0F62D010
  +000C   LFQE..... 0F62D010   AREA..... 00902000   SIZE..... 00001000

         DQE AT ADDRESS 1C9E8148
  +0000   NEXT..... 1C09C8B0   PREV..... 0F62D010   FFQE..... 1C9E8148
  +000C   LFQE..... 1C9E8148   AREA..... 00903000   SIZE..... 00001000

         DQE AT ADDRESS 1C09C8B0
  +0000   NEXT..... 0F513880   PREV..... 1C9E8148   FFQE..... 1C09C8B0
  +000C   LFQE..... 1C09C8B0   AREA..... 00906000   SIZE..... 00001000
```

Allocated Storage

IPCS Storage Analysis, CSA Analysis, Continued

⚠ **IPCS Storage analysis for ABEND878 or ABEND80A out of CSA storage**

- **Go to IPCS BROWSE mode to examine the storage for eyecatchers, etc.**
  - **Suspicious addresses x'00901000', x'00902000', x'00903000', etc**
  - **Note "AW" eyecatcher**

```
ASID(X'00D2') ADDRESS(901000.) STORAGE -----------------------------------
Command ===> L 0901000                                    SCROLL ===> C
00901000    17C1E600    00902DC8    000FCD22    00000000    | .AW....H........ |
00901010    000FCCE8    268EFA70    00000000    00000000    | ...Y............ |
00901020    40000000    00000000    00000000    00000000    |  ............... |
00901030.:90103F.--All bytes contain X'00'
00901040    00000000    00000000    17C1E600    00902F30    | .........AW..... |
00901050    000FCFE8    00000000    000FCFCC    268D6B10    | ...Y..........,. |
00901060    D1F4F6F4    F0F4F0F1    01000000    00000000    | J4640401........ |
00901070.:90108F.--All bytes contain X'00'
00901090    17C1E600    0090A510    1D82060C    F1F0F0F7    | .AW...v..b..1007 |
009010A0    13880000    267A89D0    00000000    C3D5E3E2    | .h...:i}....CNTS |
009010B0    13233060    13233060    C4D3C1F3    00000000    | ...-...-DLA3.... |
009010C0.:9010CF.--All bytes contain X'00'
```

Miscellaneous IPCS Commands

Miscellaneous IPCS Commands

△ **Miscellaneous IPCS Commands useful for IMS dumps**

- **SELECT ASID(X'aa') -or- JOBNAME(j) -or- ALL**

  – **Shows JOBNAMEs or ASIDs, respectively**

- **SUMMARY FORMAT ASID(X'aa') -or- JOBNAME(j)**

  – **MVS address space formatting - ASCB, TCBs, CDEs, RBs (FIFO), RTM2WAs, etc.**

- **SUMMARY REGS**

  – **MVS abbreviated address space formatting-no CDEs, RBs in reverse order(LIFO)**

- **CBF aaaaaaa STR(ctlblkname)**

  – **Format ctl blk**

- **LIST aaaaaaa.:eeeeeee. STRUCTURE**

  – **List storage with offsets**

- **FINDLIM 99999**

  – **Change ISPF FIND limit**

Miscellaneous IPCS Commands

△ **Miscellaneous IPCS Commands useful for IMS dumps**

- **RSMDATA VIRTPAGE RA(aaaaaaaa) ALL**
  - **Displays RSM real address**
    - ▶ **Need to add 3 0s to the right of the word in the RLOC column**
- **GTFTRACE USR(F65)**
  - **GETMAIN/FREEMAIN DS Format**
- **VERBX SUMDUMP**
  - **RTM2WA formatting**
- **SSIDATA**
  - **Subsystem SSCVT list**
- **SYSTRACE TIME(LOCAL) or TIME(GMT)**
  - **MVS System Trace Table with formatted timestamp for local time or Greenwich mean time**

Using IMS With IPCS Summary

⚠ **Using IMS with IPCS summary**

- **IMS Dumps and IPCS**

  - **SVC dumps, SYSMDUMPs, Stand-alone dumps**

- **IMS Formatting of Unformatted Machine-readable Dumps**

  - **ODF and IDF**

- **IMS Offline Dump Formatter**

  - **IPCS Verb Exit based formatter**

  - **Command syntax and options**

- **IMS Interactive Dump Formatter**

  - **ISPF dialog driven IMS dump formatter**

  - **Initialization, high level formatting, low level formatting**

Using IMS With IPCS Summary, Continued

⚠ **Using IMS with IPCS summary, continued**

- **Verifying Dump Contents**

  - **Understanding the dump we are about to diagnose**

  - **Address spaces, storage options, dump compete bits, reason for the dump**

- **Controlling IPCS for Easier Dump Analysis**

  - **Splitting, sending output to a dataset, IPCS BROWSE formatting**

- **IPCS Storage Analysis Commands**

  - **VERBX VSMDATA Private and CSA analysis**

- **Miscellaneous IPCS Commands**

  - **Memory joggers for useful dump analysis commands**