

WAVV 2005  
Colorado Springs, CO

**CICS TS for VSE/ESA Hot Topics**

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**Objectives**

- Provide you with useful CICS tips you can take home and use
- Get you to share your tips with the rest of us

**Note:** The topics covered in this presentation assume no vendor products are being used, just a standard IBM VSE and CICS TS system

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## CICS Startup and Shutdown

- CICS startup recommendations
  - Use START=AUTO in CICS startup JCL
    - Type of startup based on last CICS shutdown
      - WARM start if normal CICS shutdown
      - Emergency restart if not normal CICS shutdown
        - Backout and recovery of inflight tasks
        - CEMT PERFORM SHUTDOWN IMMEDIATE is not a normal shutdown
    - Force cold start by redefining CICS system catalog datasets (DFHGCD and DFHLCD)
      - Skeleton SKCICCLD in ICCF library 59
      - May also need to redefine restart dataset (DFHRSD)

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## CICS Startup and Shutdown...

- How can I ensure CICS TS shuts down?
  - Issue CEMT P SHUT I
    - Generally a very bad idea!
  - Manually try to find and terminate task(s)
    - Can take a long time
    - Operator training?
  - Write program to find and fix hung tasks
    - Time, effort, testing, skills available, etc.
  - Implement sample shutdown program DFH\$SDAP

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## CICS Startup and Shutdown...

- DFH\$SDAP implementation
  - Customize DFH\$SDAP if needed
    - Change delay time - default is 10 seconds
  - Translate and compile DFH\$SDAP
    - Assembler source in DFH\$SDAP.A in PRD1.BASE
  - Define transaction SDAP
  - Define program DFH\$SDAP
  - Add PLT shutdown table entry for DFH\$SDAP
    - In Phase 1 (before DFHDELIM)

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## CICS Startup and Shutdown...

- General logic flow of DFH\$SDAP
  - Phase 0 (called from PLTSD)
    - Check that system shutdown is in progress
    - START transaction SDAP with 10 second delay
  - Phase 1
    - PURGE all tasks except shutdown and itself
    - START transaction SDAP with 10 second delay
  - Phase 2
    - FORCEPURGE all tasks except shutdown and itself
    - START transaction SDAP with 10 second delay



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## CICS Startup and Shutdown...

- General logic flow of DFH\$SDAP...
  - Phase 3
    - FORCECLOSE VTAM
    - START transaction SDAP with 10 second delay
  - Phase 4
    - PERFORM SHUTDOWN IMMEDIATE
    - End SDAP task
- Console messages to keep operator informed of progress



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## Resource Definition

- CICS system definition file (CSD) is **mandatory**
  - **Required** for transactions (PCT) and transaction classes
  - **Required** for VTAM terminals, MRO/ISC connections and sessions, VSE console terminals (TCT)
  - **Required** for programs and mapsets (PPT)
    - Or use new Program Autoinstall



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## Resource Definition...

- Use of CICS CSD is optional but recommended for FCT definitions:
  - CEDA DEFINE FILE
  - CEDA DEFINE LSRPOOL
    - Index and data buffers can be defined separately
- Can still use FCT macro table
  - DFHFCT TYPE=FILE for files
  - DFHFCT TYPE=SHRCTL for LSR pools
    - One set of buffer definitions for index and data buffers
  - Must use macro table for DA files



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## Resource Definition...

- Installing files defined in the CSD
  - If the file already exists in the running system
    - CEMT SET FILE(filename) CLOSED DISABLED
  - Install the file definition
    - CEDA INSTALL GROUP(groupname) with the file definition
- Installing LSRPOOLS defined in the CSD
  - LSRPOOL is created when first file using the pool is opened
  - LSRPOOL is not deleted until all files in the pool are closed



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## Resource Definition...

### CEDA DEFINE FILE

```
DEFINE FILE(TESTFIL)          GROUP(TEST)          LSRPOOL(6)          CICS RELEASE = 0410
OVERTYPE TO MODIFY
CEDA DEFINE File( TESTFIL )
File        ==> TESTFIL
Group      ==> TEST
Description ==>
VSAM PARAMETERS
Disk       ==>
Password   ==>           PASSWORD NOT SPECIFIED
1-15 | None
Lspoolid  ==> 06
Catname   ==>
Disksharing ==>           Noreqqs | Allreqs | Modifyreqs
1-255
Nsqgroup  ==>
Sqrqaccess ==> Key
REMRTE ATTRIBUTES
REMOTESystem ==>
REMOTEName ==>
RECORDSize ==>           1-32767
1-255
+ Keylength ==>
I New group TEST created.
SYSID=CIC1 APPLID=DBDCICS
TIME: 17.06.43 DATE: 00.117
6 CCSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
DEFINE SUCCESSFUL
FF 1 HELP 2 COM 3 END
```



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### Resource Definition...

**CEDA DEFINE FILE...**

```

DEFINE FILE(TESTFIL) GROUP(TEST) LSRPOOL(6) CICS RELEASE = 0410
OVERTYPE TO MODIFY
CEDA Define File( TESTFIL )
+ INITIAL STATUS
  STATUS ==> Enabled      Enabled | Disabled | Unenabled
  Optime   ==> Firstref   Firstref | Startup
  BUFSIZE  ==> 00002      2-32767
  Indexbuffs ==> 00001     1-32767
DATATABLE PARAMETERS
  Table    ==> No        No | Cics | User
  Maxareas ==>          16-16777215
DATA FORMAT
  RECORDFormat ==> V    V | F
OPERATIONS
  Add      ==> No        No | Yes
  Browse   ==> No        No | Yes
  Delete   ==> No        No | Yes
  Read     ==> Yes       Yes | No
  Update   ==> No        No | Yes
+ New group TEST created.

SYSID=CIC1 APPLID=DBDCICS
  
```

PF 1 HELP 2 COM 3 END    6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

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### Resource Definition...

**CEDA Define LSRPOOL**

```

DEFINE L(TESTPOOL) G(TEST) L(6) DATA4K(5) DATA8K(3) DATA16K(6) INDEX512(10) I
OVERTYPE TO MODIFY
CEDA Define Lsrpool( TESTPOOL )
Lsrpool   : TESTPOOL
Group     : TEST
Description ==>
Lsrpoolid ==> 06           1-15
Maxkeylength ==> 030        0-255
Sharelimit ==>             1-100
SBuf      ==> 015          1-255
DATA BUFFERS
  DATA512   ==>            3-32767
  DATA1K    ==>            3-32767
  DATA2K    ==>            3-32767
  DATA4K    ==> 00005       3-32767
  DATA8K    ==> 00003       3-32767
  DATA12K   ==> 00006       3-32767
  DATA16K   ==>            3-32767
  DATA24K   ==>            3-32767
+ DATA32K   ==>            3-32767

SYSID=CIC1 APPLID=DBDCICS
  
```

PF 1 HELP 2 COM 3 END    6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

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### Resource Definition...

**CEDA Define LSRPOOL...**

```

DEFINE L(TESTPOOL) G(TEST) L(6) DATA4K(5) DATA8K(3) DATA16K(6) INDEX512(10) I
OVERTYPE TO MODIFY
CEDA Define Lsrpool( TESTPOOL )
+ INDEX BUFFERS
  DATA32k   ==>            3-32767
  DATA32k   ==>            3-32767
INDEX512 ==> 00010         3-32767
INDEX1K ==> 00008         3-32767
INDEX2K ==> 00003         3-32767
INDEX4K ==>               3-32767
INDEX8K ==>               3-32767
INDEX16K ==>              3-32767
INDEX32k ==>              3-32767
INDEX20k ==>               3-32767
INDEX24k ==>               3-32767
INDEX28k ==>               3-32767
INDEX32k ==>               3-32767

SYSID=CIC1 APPLID=DBDCICS
  
```

PF 1 HELP 2 COM 3 END    6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL

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## Resource Definition...

### Batch Define (DFHCSDUP)

```
// JOB DEFGROUP DEFINE GROUP DEMOGRP
// EXEC DFHCSDUP
DELETE G (DEMOGRP)
DEFINE TRANS (TEST)      GROUP (DEMOGRP)    PROGRAM (TESTPROG)
TWA (200)                TASKDATALOC (ANY)
DEFINE PROGRAM (TESTPROG) GROUP (DEMOGRP)    LANG (COBOL)
DATA (ANY)
DEFINE FILE (TESTFIL)     GROUP (DEMOGRP)    LSRPOOL (10)
STRINGS (5)              DA (6)           IN (5)
RECORDF (F)               BROWSE (YES)     UPDATE (YES)
DEFINE LSRPOOL (TESTPOOL) GROUP (TEST)       LSRPOOLID (10)
DATA4K (5)                DATA8K (3)      DATA16K (6)
INDEX512 (10)             INDEX1K (8)     INDEX2K (3)
MAXKEYLENGTH (30)          STRINGS (15)

/*
*/
```



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## Resource Definition...

- Migrate discontinued macro tables
  - Remove IBM supplied entries
  - Optionally add DFHxxx TYPE=GROUP to define RDO groups
    - DFHPCT, DFHPPT, DFHTCT and DFHFCT tables
  - Assembly with CICS TS supplied macros
  - Migrate to CSD with DFHCSDUP batch utility



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## Resource Definition...

### Migration using DFHxxx TYPE=GROUP

```
PRINT ON,NOGEN
DFHPPT TYPE=INITIAL,SUFFIX=XX
DFHPPT TYPE=GROUP, GROUP=A001
DFHPPT TYPE=ENTRY , PROGRAM=PROG01, PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY , PROGRAM=PROG02, PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY , PROGRAM=PROG03, PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY , PROGRAM=PROG04, PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY , PROGRAM=PROG05, PGMLANG=ASSEMBLER
DFHPPT TYPE=GROUP, GROUP=C001
DFHPPT TYPE=ENTRY , PROGRAM=PROG11, PGMLANG=COBOL
DFHPPT TYPE=ENTRY , PROGRAM=PROG12, PGMLANG=COBOL
DFHPPT TYPE=ENTRY , PROGRAM=PROG13, PGMLANG=COBOL
DFHPPT TYPE=ENTRY , PROGRAM=PROG14, PGMLANG=COBOL
DFHPPT TYPE=ENTRY , PROGRAM=PROG15, PGMLANG=COBOL
DFHPPT TYPE=FINAL
END
```



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## Resource Definition...

### Macro Table Migrate Job

```
* $$ JOB JNM=MIGR,DISP=D,CLASS=0
// JOB MIGR      MIGRATE CICS TABLE TO RDO
// LIBDEF PHASE,SEARCH=(PRD2.CONFIG,PRD1.BASE)
// EXEC DFHCSUP
MIGRATE TABLE (DFHPPTXX)
/*
/* $$
EOJ
```



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## Basic Security Manager

- Basic ESM supplied with VSE/ESA 2.4+
- Basic security support for CICS TS
  - Sign-on security
  - Transaction-attach security
  - Operates independent of IPL SYS SEC setting
  - Requires SIT SEC=YES, XTRAN=YES
- Support for DTSECTAB system security
  - IPL SYS SEC=YES



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## Basic Security Manager...

- BSM does not support
  - Resource security checking
  - Report Controller security
  - Command security
  - Surrogate user checking
  - MRO/ISC security



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## Basic Security Manager...

- User Profiles
  - Define using Maintain User Profile dialog
    - Requires Interactive Interface in one CICS TS partition
      - ICCF required to define ICCF users
      - Fastpath 211 from Interactive Interface menu
    - Define using batch utility IESUPDCF
    - Stored in VSE control file IESCNTL

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## Basic Security Manager...

- DTSECTXN table
  - BSM CICS transaction security definitions
  - Define using Define Transaction Security dialog or macros
    - Option under Interactive Interface resource definition dialog (fastpath 28 from IUI main menu)

**All transactions must be defined in DTSECTXN!!!**

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## Basic Security Manager...

```
TAS$SEC1          DEFINE TRANSACTION SECURITY
Enter the required data and press ENTER.
OPTIONS: 1 = ADD   2 = ALTER   5 = DELETE
OPT      TRANSACTION NAME    CICS REGION    SECURITY CLASS    GENERIC
         ADD           1
         AHRW          1
         ACCT          1
         ACBL          1
         ACGL          1
         AC01          1
         AC02          1
         AC03          1
         AC05          1
         AC06          1
LOCATE TRANSACTION NAME == >
PF1=HELP          2=REDISPLAY 3=END
8=FORWARD        5=PROCESS
```

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Basic Security Manager...

TA\$SEC2 DEFINE TRANSACTION SECURITY: ADD ENTRIES			
Enter the required data and press ENTER.			
TRANSACTION NAME	CICS REGION	SECURITY CLASS	GENERIC
C_____	_____	1	X
CEMT	_____	24	-
CEMT	TESTCICS	5	-
GL_____	TESTCICS	1	X
GL_____	PRODCICS	10	X
GL99	_____	24	-
_____	_____	1	-
_____	_____	1	-
_____	_____	1	-
_____	_____	1	-

PF1=HELP 2=REDISPLAY 3=END

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Basic Security Manager...

- Review and update BSM security definitions
  - Transaction security definitions
    - Security class 1 defined for all CICS transactions (CEMT, CEDA, CECI, etc.)
    - DITT(O) transaction defined with security class 61
  - Default security
    - Security profile required for CICS default user
      - SIT DFLTUSER=CICSUSER
      - CICSUSER profile defined with security classes 1, 60-64
    - Default user should have minimum level security
      - Security classes 1 and 61

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Basic Security Manager...

- CICS TS sign-on options
  - VSE/ESA Interactive Interface sign-on panel
    - IEGM transaction
  - CICS TS CESN transaction
    - CICS TS partition without Interactive User Interface
  - User written sign-on program
    - EXEC CICS SIGNON

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## Statistics

- Collection and reporting options
  - CICS Data Management Facility (DMF)
    - Recorded automatically or at user request
    - Print using DFHSTUP
  - User program for selected statistics
    - System Programming Interface command
      - EXEC CICS COLLECT STATISTICS
    - At user request
  - Sample program DFH0STAT
    - Output to VSE/POWER LST queue or TS
    - At user request

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## Statistics...

- Recorded by DMF automatically
  - Interval Statistics
    - Only with initialization parameter STATRCD=ON
    - User specified interval - default is 3 hours
    - Calculated forward from midnight (3 AM, 6 AM, 9 AM, etc)
  - End of Day Statistics
    - User specified end of day time - default is midnight
    - Shutdown - normal or immediate
  - Unsolicited Statistics
    - For dynamically allocated and de-allocated resources
      - Autoinstall terminals, files, LSRPOOLS, transactions, programs, etc.

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## Statistics...

- Recorded by DMF on user request
  - CEMT command
    - CEMT PERFORM STATISTICS RECORD ALL
    - CEMT PERFORM STATISTICS RECORD ALL RESETNOW
  - User-written program
    - EXEC CICS PERFORM STATISTICS RECORD ALL
    - EXEC CICS PERFORM STATISTICS RECORD ALL RESETNOW

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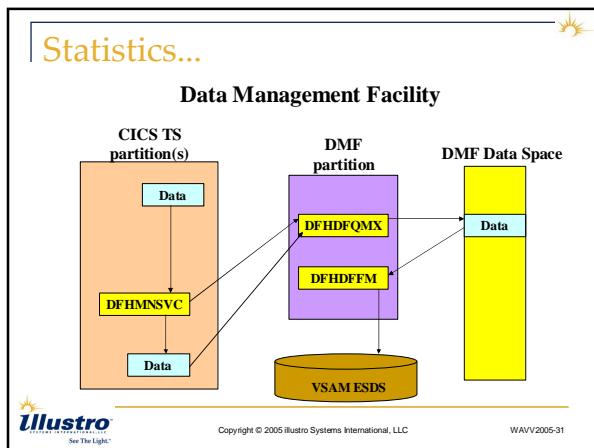
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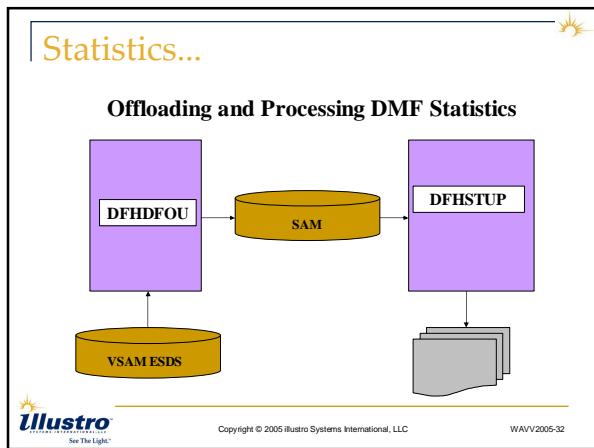
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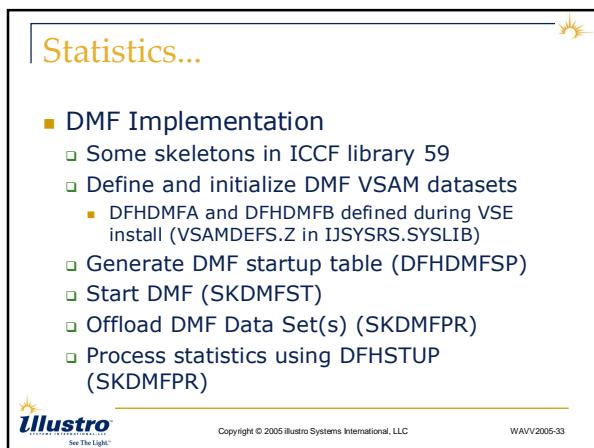
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### Statistics...

- Sample statistics program DFH0STAT
  - ❑ Same as DMF except no unsolicited statistics
  - ❑ Can be invoked from
    - Terminal or VSE console
    - PLT shutdown table
    - As a STARTed transaction
  - ❑ Output to
    - VSE/POWER LST queue using Report Controller
    - CICS Temporary Storage queue
  - ❑ Uses EXEC CICS System Programming Interface commands
  - ❑ Source program and mapset in PRD1.BASE

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### Statistics...

- DFH0STAT Implementation
  - ❑ Assemble mapset DFH0STM.A
  - ❑ Translate and compile COBOL program DFH0STAT.C
  - ❑ Install RDO group DFH\$STAT
    - Programs must be defined with EXECKEY(CICS) if used in shutdown PLT
  - ❑ Define transaction STAT to security manager
  - ❑ Run transaction STAT or add DFH0STAT to shutdown PLT table

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### Statistics...

- Monitoring CICS DSA usage (CEMT)

```
I DSA
STATUS: RESULTS - OVERTYPE TO MODIFY
SOSstatus( NOTSOS )

Dsasize( 05242880 )
Cdssize( 00524288 )
Rdsasize( 00524288 )
SDssize( 01048576 )
Udssize( 00262144 )

Edsalimit( 0026214400 )
Ecdssize( 0003145728 )
Erdsasize( 0003145728 )
Edssize( 0001048576 )
Eudsasize( 0001048576 )

RESPONSE: NORMAL
PF 1 HELP      3 END
```

SYSID=CIC1 APPLID=DRBCCICS
TIME: 11.49.53 DATE: 04.28.00
7 SBH 8 SFH 9 MSG 10 SB 11 SF

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### Statistics...

- Monitoring CICS DSA usage (IEDC)

```

IESADMDCST          CICS TS Storage Reporter   Time: 09:02:27
Applid: DBDCCICS   Sysid: CIC1  Jobname: CICSCCP  CICS TS Level: 111
Storage Protection ..... INACTIVE      Reentrant Programs .... PROTECT
                                         CICS Trace Table size... 80
Extended DSA:           (All sizes in kbytes)  LIMIT  25600
                         CDSA    UDSA    SDSA    RDSA  Totals
Current DSA Size..... 3072   1024   132   6144  11264
Current DSA used..... 2584   64     132   5948  8728
*Peak DSA used..... 2608   64     132   5948
Peak DSA Size..... 3072   1024   1024  6144  11264
Largest free area/free Storage 1.00   1.00   1.00  0.55
Times short-on-storage (SOS).. 0      0      0      0      0
                                         LIMIT  5120
DSA:                   CDSA    UDSA    SDSA    RDSA  Totals
Current DSA Size..... 512    256    512    512   1792
Current DSA used..... 408    8     404    416   1236
*Peak DSA used..... 428    32    424    416
Peak DSA Size..... 512    256    512    512   1792
Largest free area/free Storage 0.69   1.00   0.93  0.83
Times short-on-storage (SOS).. 0      0      0      0      0
PF1=HELP              2=REFRESH 3=END        4=RETURN

```

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### Statistics...

- CICS DSA storage monitoring (IEDC)
  - VSE IUI Display CICS TS Storage Dialog
    - Fastpath option 364
  - Can be implemented in CICS without IUI
    - Copy transaction and program definitions from groups VSESPG and DFH\$STAT
      - Transaction IEDC
      - Programs IESXCTS, IESSVL, IESCVA, IESSION, IESEDSC, IESSCRH, DFH\$STAS
      - Mapset IESEDSC

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### Problem Determination

- Review SIT dump and trace options
  - DUMP=YES|NO
    - Controls taking of system dumps
  - SYDUMAX=999,TRDUMAX=999
    - Maximum number of system and transaction dumps per dump code
    - VSE supplied SIT skeletons specified 1 for each
  - TRTRANSZ=512
    - Size of transaction trace table in KB
  - TRTABSZ=256
    - Size of system trace table in KB

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### Problem Determination...

- Suppress system dumps for ASRA and ASRB abend
  - SIT ABDUMP and PCDUMP options obsolete
  - Specify in system dump table

```
CEMT SET SYDUMPCODE(AP0001) ADD NOSYSDUMP
CEMT SET SYDUMPCODE(SR0001) ADD NOSYSDUMP
or from a PLT initialization program

EXEC CICS SET SYDUMPCODE(AP0001) ADD NOSYSDUMP
EXEC CICS SET SYDUMPCODE(SR0001) ADD NOSYSDUMP
```

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### Problem Determination...

- Analyzing short on storage problems
  - Create entries in system dump table for short on storage conditions

```
CEMT SET SYDUMPCODE(SM0131) ADD SYSDDUMP MAX(1)
CEMT SET SYDUMPCODE(SM0133) ADD SYSDDUMP MAX(1)
or from a PLT initialization program

EXEC CICS SET SYDUMPCODE(SM0131) ADD SYSDDUMP MAX(1)
EXEC CICS SET SYDUMPCODE(SM0133) ADD SYSDDUMP MAX(1)
```

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### Problem Determination...

- Analyzing short on storage problems...
  - Format transaction and storage manager domains in system dump

```
INFOANA CICS system dump format options
CALL DFHPD410 DATA XM=1,SM=1

==SM: Task subpool summary
      SMX Addr Name   Id Loc Acc  Gets  Frees  Elems  Elemtsg  Pagesgt
      03418020 M0000004 01 B   C    0     0     0      0       0      OK
Last 7 digits
are
Task number
      C0000004 03 A   C    1     0     1      1472    4K
      B0000004 02 B   C    0     0     0      0       0      OK
      U0000004 04 A   C    0     0     0      0       0      OK
      ...
      ...

==SM: Domain subpool summary (CDSA)
      Name    Id Chn  Initf Bndry Fxlen Q-c  Gets  Frees  Elems  Elemtsg  Pagesgt
      AP_TC24 47  16K  128  1536 Y    83    0     8      12288   20K
      BSSP1   5C   32    0     0     0      0       0      0      OK
      BSSP2   5D   4096  0     0     0      0       0      0      OK
      ...
```

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WAVV2005-42

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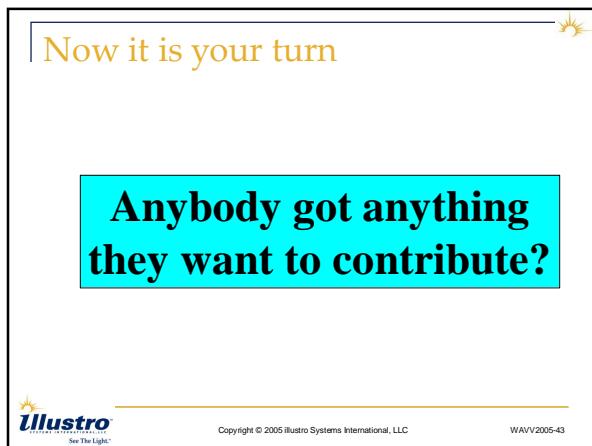
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