IBM GLOBAL SERVICES

Session: E45

CICS TS for VSE/ESA Hot Topics

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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
```

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)

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

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)

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

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

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

Resource Definition…

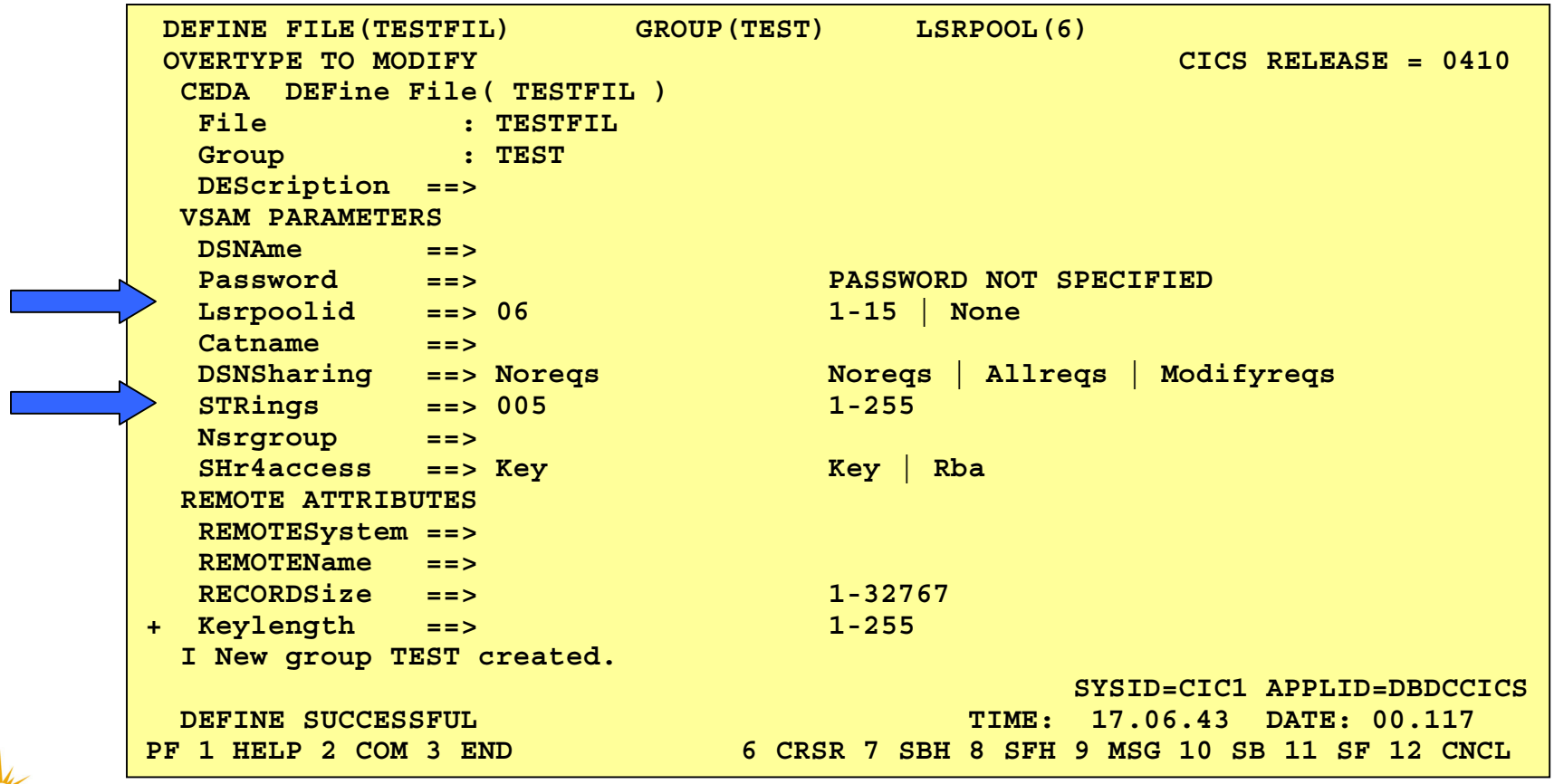
- Use of CICS CSD is optional but recommended for FCT definitions:
  - CEDA DEFINE FILE
  - CEDA DEFINE LSRPOOL
    - Index and data buffers can be defined separately
  - Can still use FCT macro table
    - DFHFCT TYPE=FILE for files
    - DFHFCT TYPE=SHRCTL for LSR pools
      - One set of buffer definitions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

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

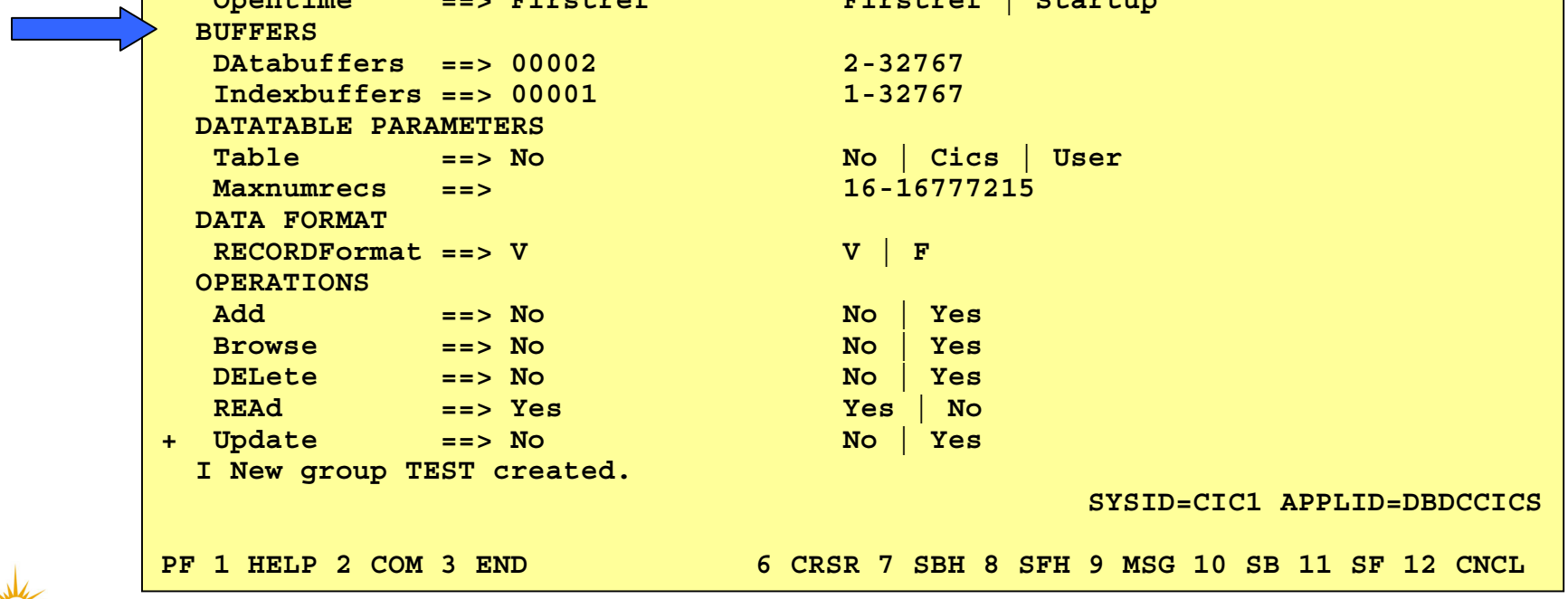
Resource Definition…

CEDA DEFINE FILE



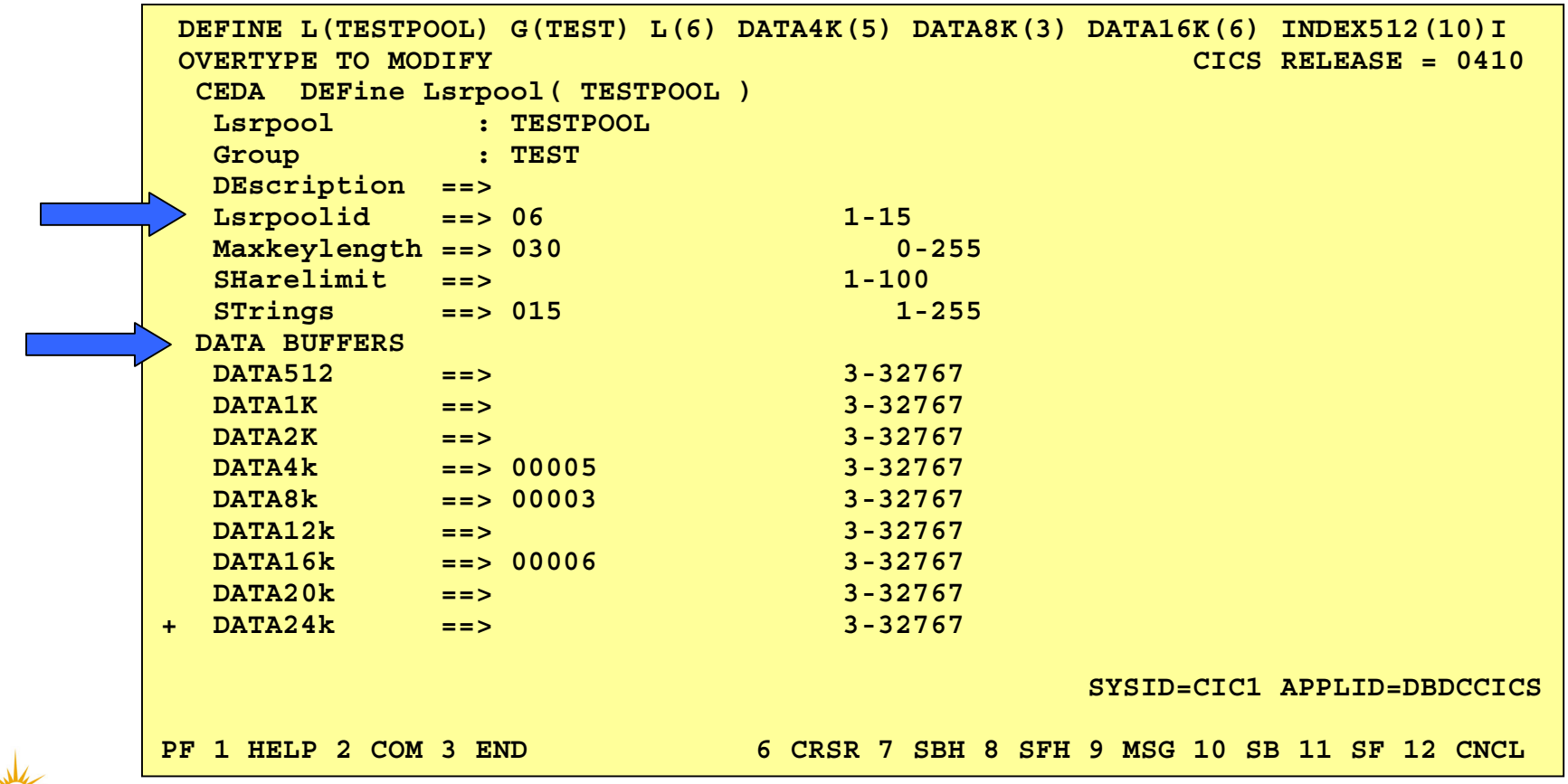
Resource Definition…

CEDA DEFINE FILE...



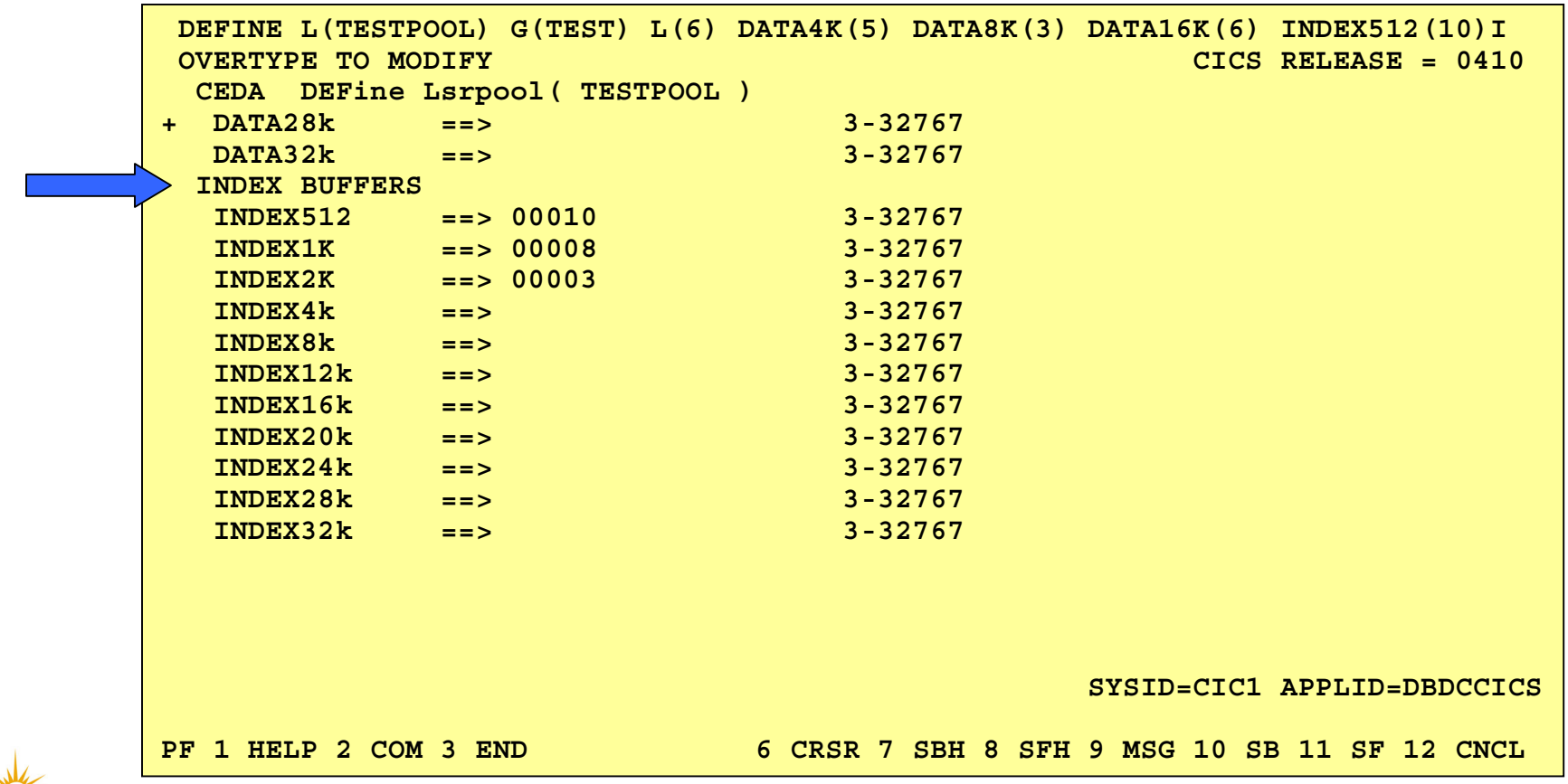
Resource Definition…

CEDA DEFINE LSRPOOL



Resource Definition…

CEDA DEFINE LSRPOOL...



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)
/*
/&
```

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

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
```

Resource Definition…

Macro Table Migrate Job

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

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

Basic Security Manager...

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

Basic Security Manager...

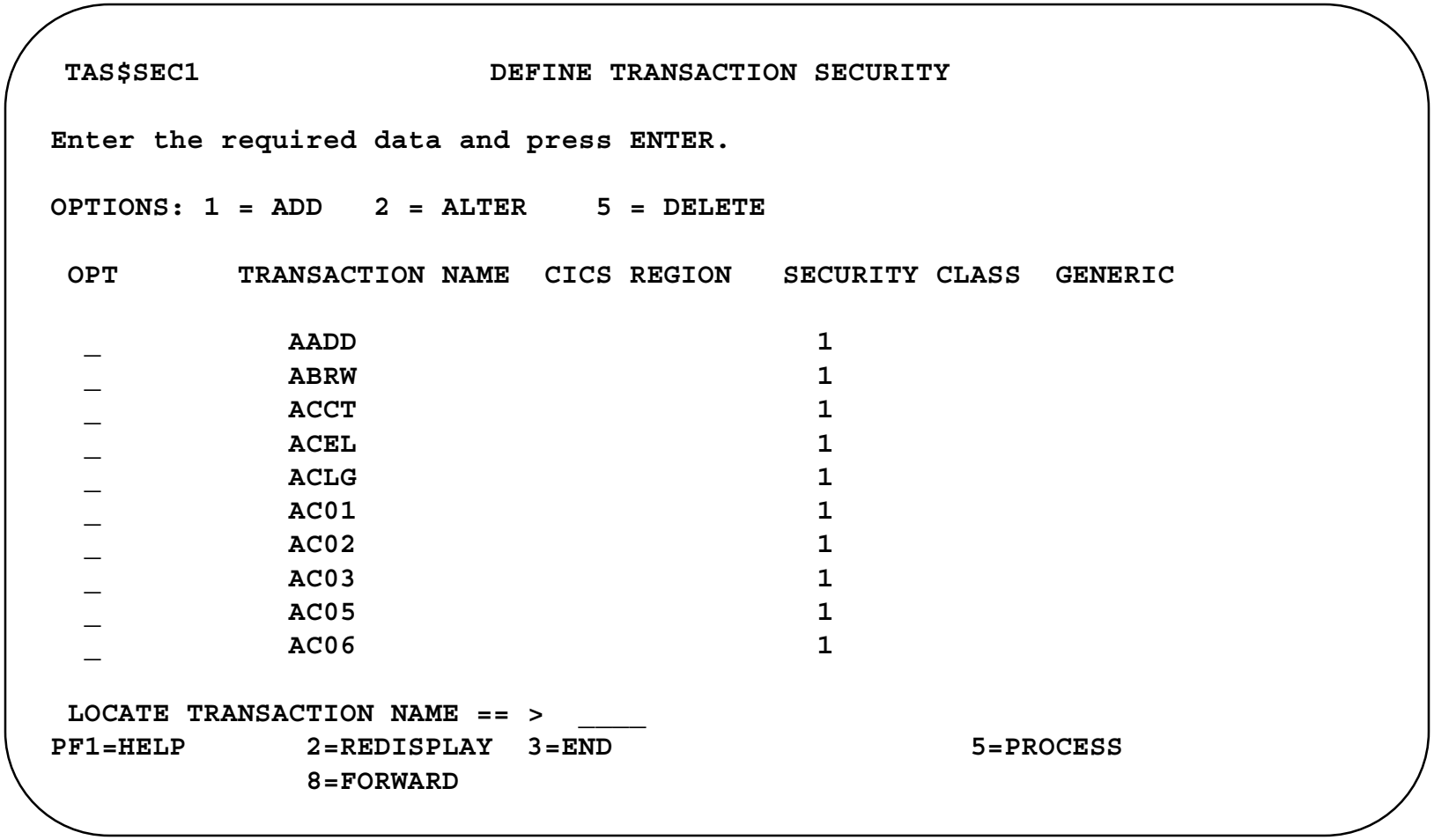
- User Profiles
  - Define using Maintain User Profile dialog
    - Requires Interactive Interface in one CICS TS partition
      - ICCF required to define ICCF users
    - Fastpath 211 from Interactive Interface menu
  - Define using batch utility IESUPDCF
  - Stored in VSE control file IESCNTL

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!!!

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

  _             AADD                            1
  _             ABRW                            1
  _             ACCT                            1
  _             ACEL                            1
  _             ACLG                            1
  _             AC01                            1
  _             AC02                            1
  _             AC03                            1
  _             AC05                            1
  _             AC06                            1

 LOCATE TRANSACTION NAME == >  ____
PF1=HELP        2=REDISPLAY   3=END                        5=PROCESS
                8=FORWARD
```

Basic Security Manager...

```
 TAS$SEC2          DEFINE TRANSACTION SECURITY: ADD ENTRIES

Enter the required data and press ENTER.

TRANSACTION   CICS         SECURITY  GENERIC
NAME          REGION       CLASS

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
```

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

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

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

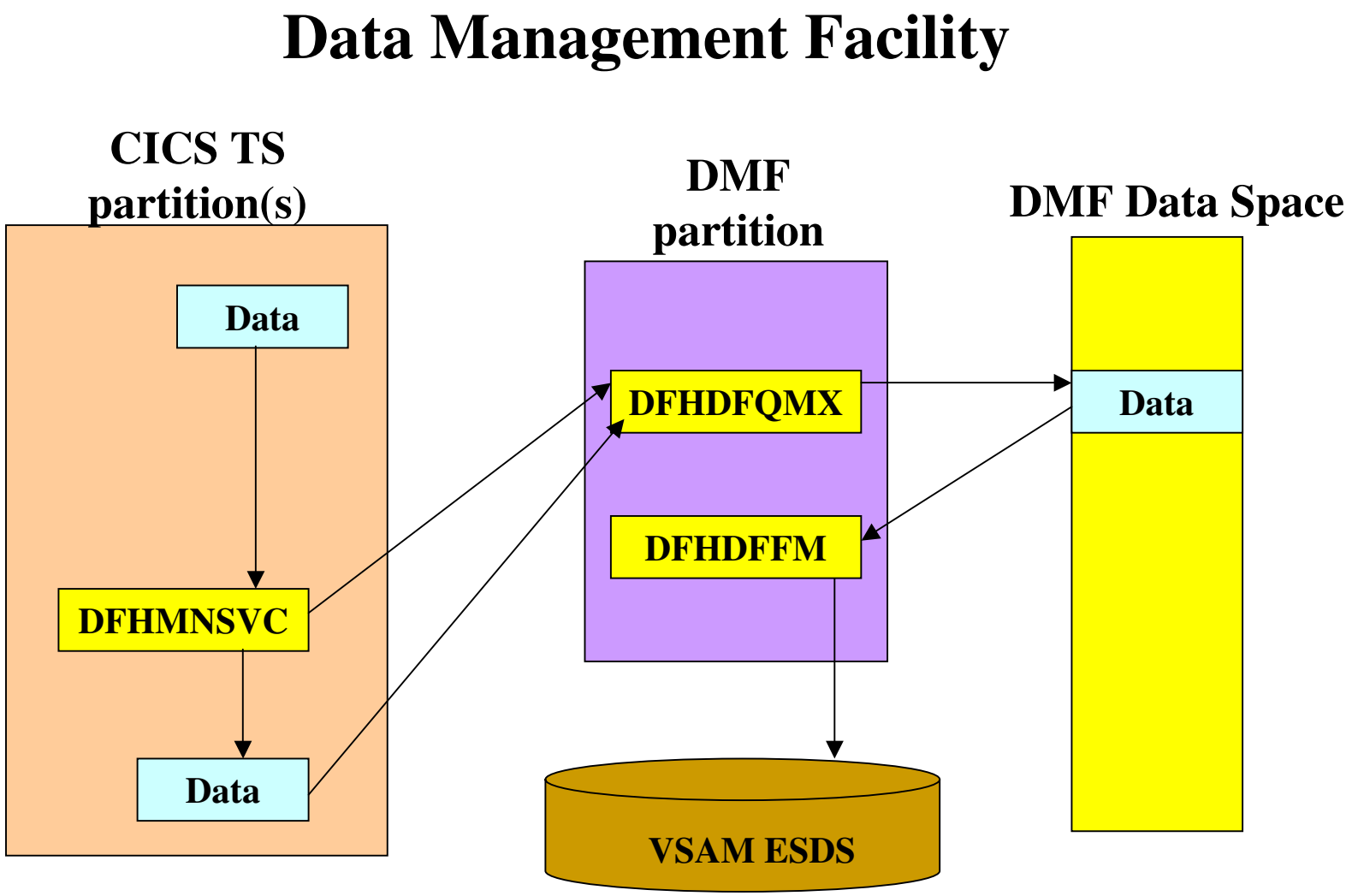
Statistics...

- 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.

Statistics...

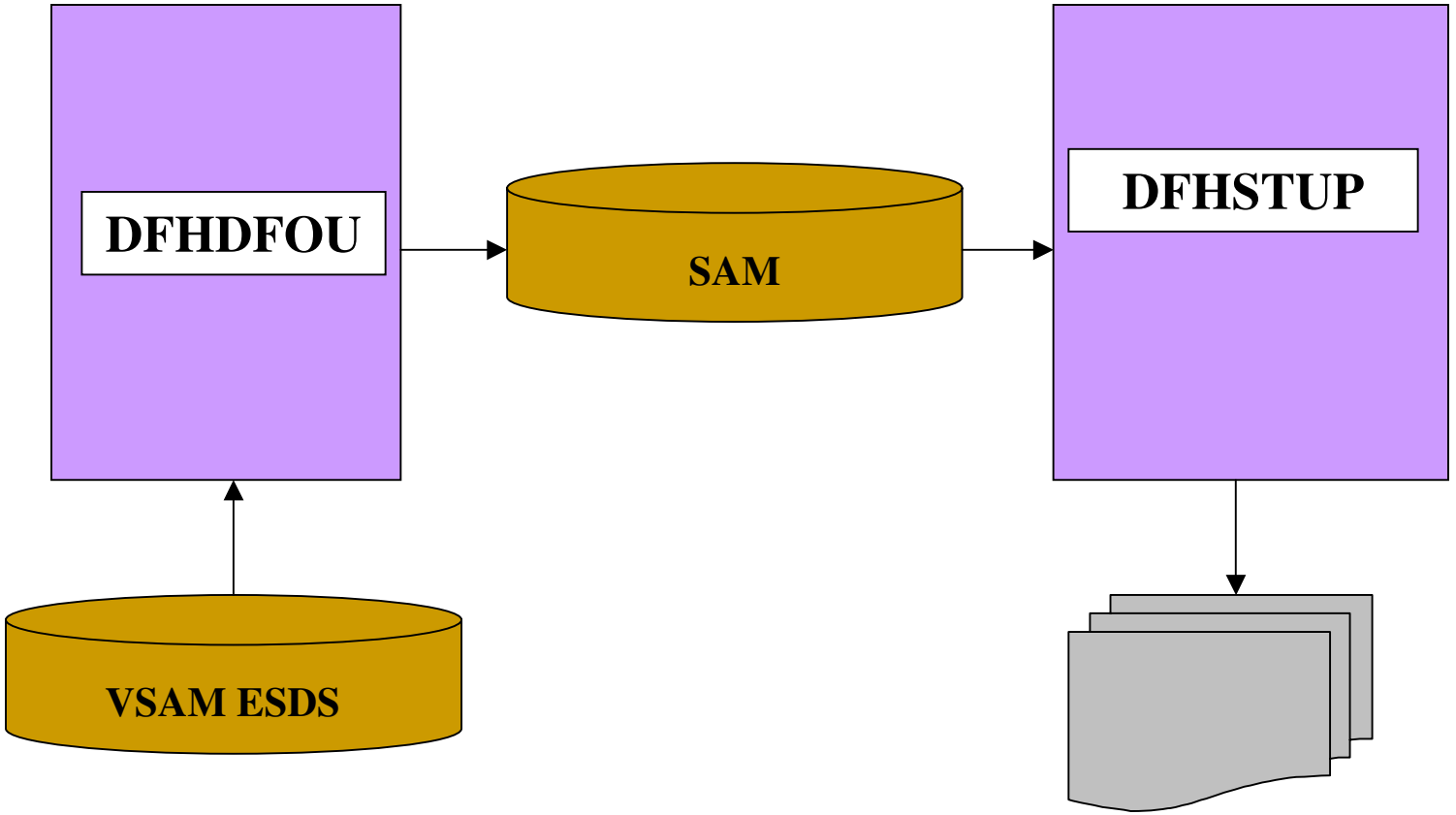
- Recorded by DMF on user request
  - CEMT command
    - CEMT PERFORM STATISTICS RECORD ALL
    - CEMT PERFORM STATISTICS RECORD ALL RESETNOW
  - User-written program
    - EXEC CICS PERFORM STATISTICS RECORD ALL
    - EXEC CICS PERFORM STATISTICS RECORD ALL RESETNOW

Statistics...



Statistics...

Offloading and Processing DMF Statistics



Statistics...

- DMF Implementation
  - Some skeletons in ICCF library 59
  - Define and initialize DMF VSAM datasets
    - DFHDMFA and DFHDMFB defined during VSE install (VSAMDEFS.Z in IJSYSRS.SYSLIB)
  - Generate DMF startup table (DFHDMFSP)
  - Start DMF (SKDMFST)
  - Offload DMF Data Set(s) (SKDMFPR)
  - Process statistics using DFHSTUP (SKDMFPR)

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

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

Statistics...

- Monitoring CICS DSA usage (CEMT)

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

  Dsalimit( 05242880 )
   Cdsasize( 00524288 )
   Rdsasize( 00524288 )
   SDsasize( 01048576 )
   Udsasize( 00262144 )

  EDsalimit( 0026214400 )
   ECdsasize( 0003145728 )
   ERdsasize( 0005242880 )
   ESdsasize( 0001048576 )
   EUdsasize( 0001048576 )




                                                SYSID=CIC1 APPLID=DBDCCICS
  RESPONSE: NORMAL                          TIME:  11.49.53  DATE: 04.28.00
PF 1 HELP       3 END                  7 SBH 8 SFH 9 MSG 10 SB 11 SF
```

Statistics...

- Monitoring CICS DSA usage (IEDC)

```
IESADMDCST                      CICS TS Storage Reporter          Time:  09:02:27
  Applid: DBDCCICS    Sysid: CIC1    Jobname: CICSICCF    CICS TS Level:   111
Storage Protection ..... INACTIVE       Reentrant Programs ..... PROTECT
                                        CICS Trace Table size..      80
Extended DSA:                       (All sizes in kbyte)    LIMIT   25600
                                   ECDSA    EUDSA    ESDSA    ERDSA  Totals
  Current DSA Size .............    3072     1024     1024     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

DSA:                                                        LIMIT    5120
                                    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
```

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$STAT
      - Transaction IEDC
      - Programs IESXCTS, IESSVL, IESCVDA, IESSCRIO, IESEDSC, IESSCRH, DFH$STAS
      - Mapset IESEDSC

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

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
```

Problem Determination…

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

```
CEMT SET SYDUMPCODE(SM0131)  ADD  SYSDUMP MAX(1)
CEMT SET SYDUMPCODE(SM0133)  ADD  SYSDUMP MAX(1)

                or from a PLT initialization program

EXEC CICS SET SYDUMPCODE(SM0131)  ADD  SYSDUMP MAX(
EXEC CICS SET SYDUMPCODE(SM0133)  ADD  SYSDUMP MAX(
```

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   Elemstg      ...g
   03418020 M0000004 01  B   C        0       0       0         0        0K
            C0000004 03  A   C        1       0       1      1472        4K
            B0000004 02  B   C        0       0       0         0        0K
            U0000004 04  A   C        0       0       0         0        0K
              ...
==SM: Domain subpool summary (CDSA)

   Name     Id Chn  Initf Bndry Fxlen Q-c    Gets   Frees   Elems   Elemstg      ...est
   AP_TCA24 47        16K   128  1536  Y       83      75       8     12288          20
   BBSSP1   5C              32                 0       0       0         0           0
   BBSSP2   5D            4096                 0       0       0         0           0
    ...
```

Last 7 digits are Task number

Now it is your turn

Anybody got anything they want to contribute?

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