WAVV 2000 Conference

Making the most of CICS Transaction Server
(including REXX for CICS)

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Agenda

- Introduction
- Autoinstall for programs
- External CICS Interface
- Shared Data Tables
- Resource Definition
- Automatic Journal Archive
- Monitoring and Statistics
- REXX for CICS
- Summary

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Introduction

- CICS Transaction Server offers many enhancements over CICS for VSE/ESA, which
  - Are easy to implement
  - Bring great benefits
  - Result in easier management of CICS systems
  - Result in a reduction in system resource usage
  - Introduce improved statistics reporting
  - And introduce improved monitoring data collection
- Accessing CICS from the Web is not covered in this presentation
  - This was covered in the presentation, **CICS 3270 Bridge and Web Support** yesterday.
  - and an alternative method in **The CICS Transaction Gateway: Web and Java Access to CICS** on Monday.

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Autoinstall for Programs

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Autoinstall for programs

- Easier management
  - Programs, mapsets and partitionsets don't have to be defined to CICS before being used
- Less systems resource usage
  - Table definitions are only created when needed
- Faster restarts
  - Cold starts don't have to install so many definitions
  - Warm and emergency starts may be quicker depending on whether cataloging is used
- System Autoinstall
  - Does not require model definitions, and the Autoinstall exit is provided ready for use

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Autoinstall for programs - Enabling

- Its easy!
- Define the CSPL Transient Data Queue
- Decide whether you want to catalog Autoinstalled programs
  - If yes, specify PGAICTLG=YES in the SIT
  - If no, specify PGAICTLG=NO in the SIT
- Add Group DFHPGAIP to CICS start up list
- Specify the name of your exit in PGAIEXIT in the SIT
  - CICS supplied DFHPGADX
  - If you choose another exit, ensure there is a definition for it in the CSD
- Specify PGAIPGM=ACTIVE in the SIT
- Start CICS and its done

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Autoinstall for programs - Other considerations

- Autoinstall exit is not called for programs beginning DFH
- Supplied samples
  - COBOL is DFHPGAOX
  - PL/I is DFHPGALX
  - C is DFHPGAHX
- COMMAREA passed to the program is mapped by DFHPGACD
- Writing the exit in an LE language
  - If you choose to implement the exit in an LE language (for example COBOL) then you must ensure that all LE program definitions are installed before enabling the exit
    - *Refer to the Systems Definition Guide for full instructions*
- Change the default autoinstall program or model if you want to modify such things as CEDF, DATALOCATION

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External CICS Interface

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External CICS Interface

- Makes it easy to access a CICS application from a batch program
- Communication is via **pipes**
  - A pipe is a one-way communication path
  - Allocated on an MRO session
  - Supported via DFHIRP (Inter-Region communication program)
- One client program can establish multiple connections with different CICS
  - May be on behalf of different users
  - May be under different sub-tasks
- There are two programming interfaces
  - EXEC CICS LINK programming interface
  - EXCI CALL Interface

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External CICS Interface - EXEC CICS LINK

- For low frequency or single DPL requests
- Easier to code
  - Less programming errors
- Under the covers the EXEC CICS LINK is expanded into EXCI calls
- For example, you could call a program to
  - close/open files before/after running a backup job
  - disable/enable a transaction before/after running an update job for the associated program

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External CICS Interface - EXCI CALL Interface

- When you want to execute many requests
- More efficient than EXEC CICS LINK
  - You issue INITIALIZE_USER and ALLOCATE_PIPE only once
  - Then lots of DPL requests
  - Finally, you issue DEALLOCATE_PIPE when complete
- For example, you can call a program to
  - Produce batch reports based on a file open to CICS
  - Update a file from a batch process while the file is open to CICS

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External CICS Interface - Getting started

- CICS supplied sample programs
  - Server program
    - *DFH$AXCS (available only in Assembler)*
  - Client programs
    - *DFH$AXCC (Assembler)*
    - *DFH0CXCC (COBOL)*
    - *DFH$PXCC (PL/I)*
    - *DFH$DXCC (C)*
- These programs can be used to learn both EXEC CICS LINK and EXCI CALL interface techniques
- Client programs must be translated by the CICS TS translator using translator option EXCI
- Client programs must be link-edited with DFHXCSTB
- All client programs must be written to AMODE(31) standards

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Shared Data Tables

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Shared Data Tables

- Replaces and enhances the Data Tables support in CICS/VSE V2.3
  - Uses Cross memory services to access data 'owned' by another CICS
- Provides file sharing at reduced cost
  - Eliminates the need for function shipping for most read and browse requests
    - *Function ship may still be involved if READ UPDATE specified or record excluded from the table, for instance*
- Enhances support for more access requests to files in a data table
  - Allows generic read requests and allows browse requests
  - Which provides enhanced API support for User Maintained Tables
- Frees the FOR to process other requests since the access is done in the AOR
- Can result in smaller dumps and improved security, since the data is held in a separate address space, and is not dumped in the result of a CICS dump
- Improved availability
  - Several AORs can access the same data set concurrently

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Shared Data Tables -Enabling

- Its easy!
- Ensure the following modules are in the SVA
  - DFHDTSVC, DFHCSEOT and DFHDTSAN
- Ensure that user exits are written using the command-level standards for
  - XDTRD, XDTAD and XDTLC (this step is optional!)
- Review VSE IPL parameters VSIZE and DSIZE to ensure that there is enough virtual and data space storage available
  - Storage is allocated in the data space initially as 2M and when more is needed, it is increased in 2M chunks
- Change file definitions to use Shared Data Tables
  - Specify Table as User or CICS, and define maximum number of records in RDO FILE definition
  - Specify TYPE=USERTABLE or TYPE=CICSTABLE in DFHFCT

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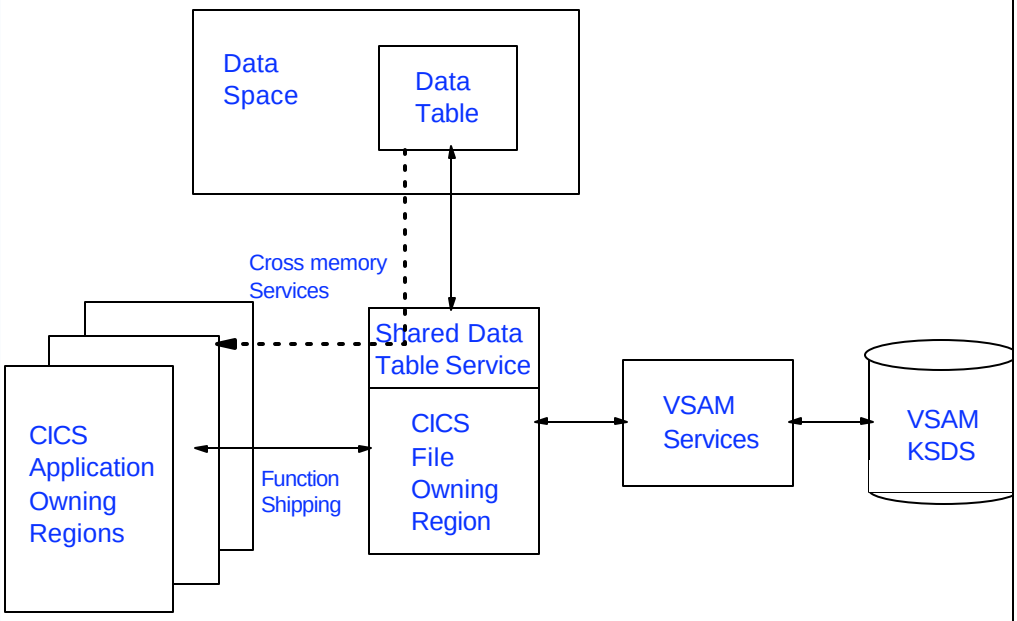
Shared Data Tables - In action



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Resource Definition

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Resource Definition

- RDO for FILES
- RDO for CONSOLES
- Removing Installed resources
- Single resource Install
- Commitment of resources
- Other snippets

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Resource Definition - RDO for FILES

- Dynamic addition of file resources to running CICS system of
  - VSAM files
    - *CEDA DEFINE FILE() DSNAME() CATNAME()*
  - Remote VSAM or DAM files
    - *CEDA DEFINE FILE() REMOTESYSTEM() REMOTENAME()*
  - VSAM Local Shared Resource Pools
    - *CEDA DEFINE LSRPOOL() LSRPOOLID() MAXKEYLENGTH()*
  - Shared Data Tables
    - *CEDA DEFINE FILE() TABLE(CICS|USER)*
- DLBLs no longer required for VSAM files
  - If all VSAM files are defined using Resource Definition Online

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Resource Definition - RDO for CONSOLES

- You must define consoles now for the system operator and any IUI user wishing to u console displays and any CMS user wishing to use VSECMD
- For example
  - System console
    - *DEFINE TERMINAL(xxxx) CONSNAME(SYS) TYPETERM(DFHCONS)*
  - Console for IUI user USRA
    - *DEFINE TERMINAL(xxxx) CONSNAME(USRA) TYPETERM(DFHCONS)*
- Pool of consoles
  - To allow a number of IUI users to access CICS without the need to define each console individually, specify a pool of consoles
    - *DEFINE TERMINAL(CO01) CONSNAME(DFHCON01) TYPETERM(DFHCON*
    - *DEFINE TERMINAL(CO02) CONSNAME(DFHCON02) TYPETERM(DFHCON*
    - *...*
- VSE supply console definitions for the system console and 20 pooled consoles in VSESPG

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Resource Definition - Removing Installed Resources

- Installed resources can be removed from a running CICS
- Use CEMT DISCARD or EXEC CICS DISCARD
- Can be used for all resources, except
  - CONNECTION
  - SESSION
  - TERMINAL
  - TYPETERM
- Does not delete from the CSD - it only removes the definition from CICS
  - The discard action is preserved across warm and emergency restarts

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Resource Definition - Single Resource Install

- Install a single resource
- CEDA EXPAND GROUP has been enhanced to allow INSTALL to be typed against a resource
  - EXEC CICS CREATE can also be used to install a single resource, without having to define and install the resource on the CSD
- Cannot be used for CONNECTIONS
  - Except if CONNECTION has method(INDIRECT) specified
- Cannot be used for SESSIONS

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Resource Definition - Commitment of Resources

- Resources are now committed immediately
  - This means that a group does not need to have every resource successfully installed before committing the individual resources
- Applied to most resources such as
  - FILE
  - PROGRAM
  - TRANSACTION
- Some resources still committed at the group level
  - CONNECTION
  - SESSIONS
  - TERMINAL
  - TYPETERM

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Resource Definition - other snippets

- Descriptive comments
  - A description may be associated with all resources in the CSD
- Invoking DFHCSDUP from user programs
  - A user program may call DFHCSDUP, perhaps allowing a flexible user interface to be written to DFHCSDUP
- DFHCSDUP supports additional commands
  - You can use ALTER from DFHCSDUP
    - *This support also includes generic ALTER*
  - USERDEFINE allows you to specify your own defaults
- Programmable Interface to CEDA
  - Is now documented

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Automatic Journal Archive

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Automatic Journal Archive

- Prompt submission of Archive Jobs
  - Eliminates the need for CICS tasks waiting for Journal Archiving to take place, and eliminates the need for JOUROPT=PAUSE on the DFHJCT definitions
- Removes the need for operator intervention
  - Unless the archive is to tape, or the archive job fails, the operators do not need to intervene to allow the journal to be archived.
- Provides greater security
  - Because CICS will not overwrite the journal until the journal is archived, any journal data required for recovery is not lost
- Eliminates the need for you to code your own automated procedures
  - You can still use DFHXJCO and DFHXJCC user-replaceable modules if you choose not use automatic journal archive

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Automatic Journal Archive - Enabling

- Its easy!
- Define the journal archive control data set - DFHJACD
  - Its a VSAM file with the following characteristics
    - *Its an RRDS with a maximum of 198 records, record size 505 and CISIZE of 512*
  - Add the DLBL to your CICS startup job stream
- Tailor the skeleton job
  - Supplied as DFH$ARCH.J in PRD1.BASE
    - *Should be copied to a user sub-library, and must be named xxxx.DFHJASP*
    - *Then include LIBDEF SOURCE,SEARCH statement for the sub-library in the CICS start-up JCL*
- Add support to DFHJCT
  - Add AUTOARCH to JOUROPT for each journal you want to archive automatically, and ensure JTYPE=DISK2 is specified
  - Add ARCHJCL=xxxx for each journal you want to archive automatically

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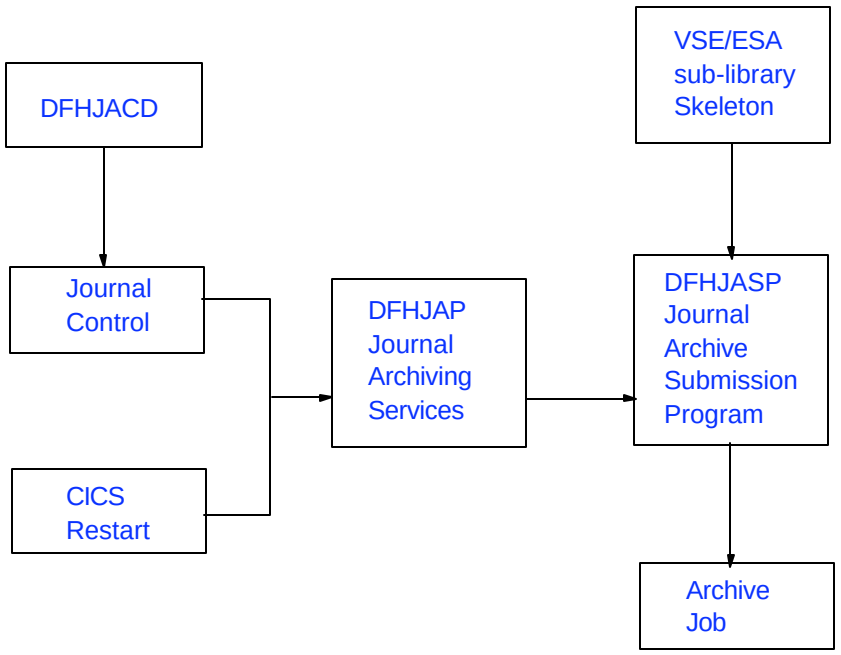
Automatic Journal Archive - Job Submission



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Monitoring and Statistics

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Monitoring and Statistics

- Monitoring and Statistics have been completely rewritten
- Monitoring no longer produces accounting records
- Statistics reporting is now performed by off-line utility DFHSTUP
- Now all data is collected by new CICS facility - DMF
- For more information on Performance and Tuning see session
  - CICS T/S Tuning Tips, Techniques and Performance at 4:15pm

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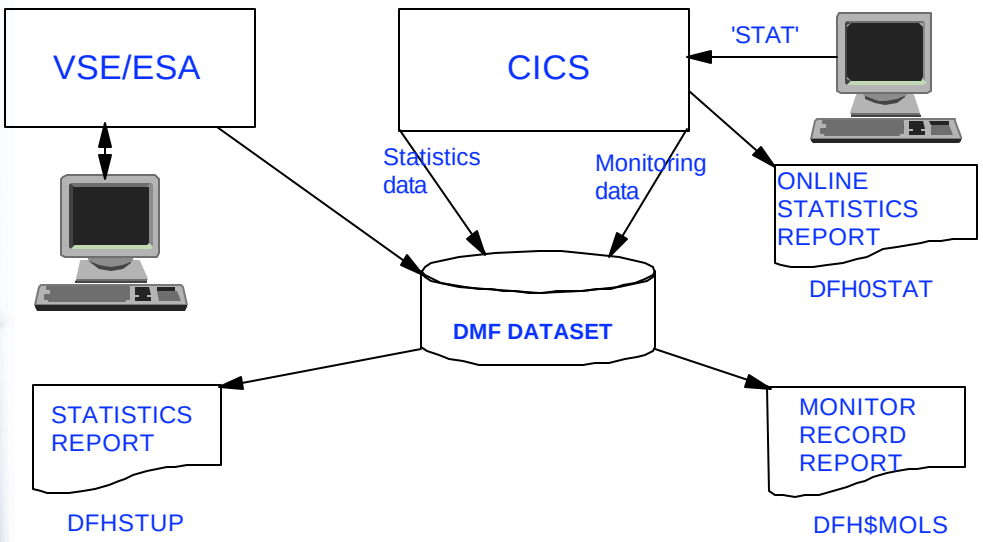
Monitoring and Statistics - Overview



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Monitoring and Statistics - DMF Overview

- DMF has been written to provide a similar facility to SMF provided by MVS
- When you start DMF you must have OS390 coded on the EXEC statement for DFHDFSIP
- It provides facilities to
  - collect data passed to it (in SMF format)
    - *initially in a data space*
  - offload the data to a VSAM ESDS file
  - copy the ESDS data to sequential files for further processing, and clear the ESDS files

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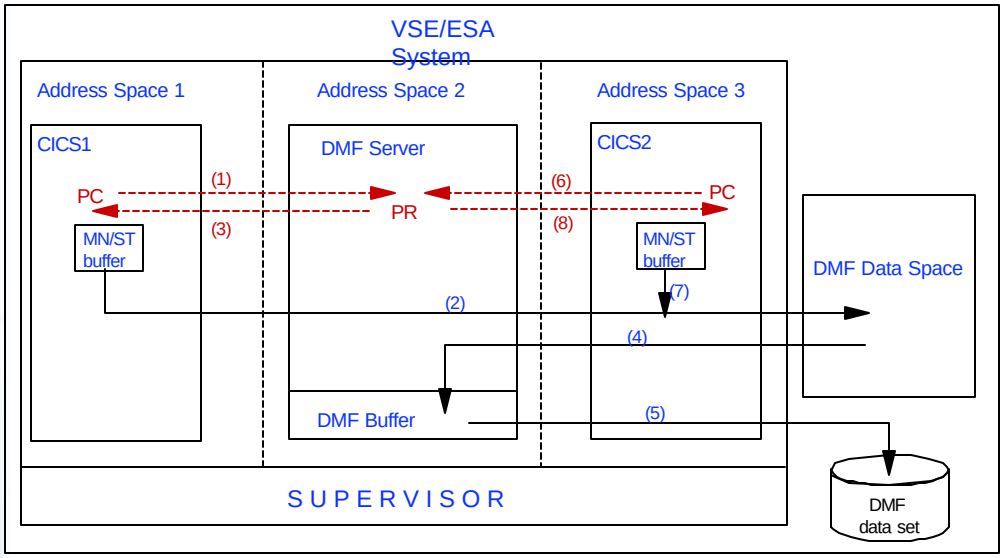
Monitoring and Statistics - DMF Overview



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Monitoring and Statistics - Getting started

- Generate the start up table using the DFHDMFM macro
  - Default values for everything except data space size, trace table size and suffix
  - Identify start up table to DFHDFSIP by SUFFIX=xx SYSIPT parameter
  - Defaults are supplied in table with suffix SU
- Define VSAM ESDS files to be used by DMF
  - These are used by DMF as a pool of files
- Initialize the VSAM files
  - Use DFHDFOU batch utility
- Tailor DMF start up JCL
- Submit JCL

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Monitoring and Statistics - What next?

- Offload data to sequential file
- For processing of statistics data
  - Use DFHSTUP
  - Can get many types of report
    - *SUMMARY - equivalent to old SHUTDOWN statistics*
    - *INTERVAL - can select based on APPLID, TIME, and type of record*
- For processing of monitoring data
  - Use DFH$MOLS
  - May have to use DFHMNDUP as well
    - *Use this program when CICS run fills more than one DMF dataset, or when DMF is started after CICS was started. It creates a dictionary record.*
  - But advice is to get a monitoring package to better analyze the data
- DFHSTUP requires a SORT package, DFH$MOLS can run without SORT, but not if two APPLIDs are to be reported together.

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Monitoring and statistics - Online display

- Statistics sample online program - DFH0STAT
  - Originally written as an aid to CICS and MVS storage usage
  - Command level, COBOL for VSE/ESA and Assembler
  - Illustrates the use of the EXEC CICS API commands
    - *EXEC CICS INQUIRE and EXEC CICS COLLECT STATISTICS*
    - *Statistics report output using the Report Controller or TS*
    - *DFH0STAT can be invoked*
    - *from a terminal or console*
    - *from the PLTPI or PLTSD*
    - *as a STARTed transaction*
- Caution! - if used as a replacement for the shutdown statistics

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Monitoring and statistics - Online display

Sample statistics online program - DFH0STAT

```
                    Sample Program - CICS Statistics Print
                                                    01/11/99  14:02:36

  Type in destination fields if required. Press Enter to print


      Jobname  . . : CICS41
      Applid . . . : CICSA2
      Sysid  . . . : CICS

      Node . . . . . *          Type in a valid Node. * is default
      Userid . . . . *          Type in a valid Userid. * is default
      Class  . . . . A          Type in a valid Class. A is default

      TS Queue Name             Type in TS Queue name, to send out-
                                put to this TS queue instead.
      Abbreviated               Enter x for abbreviated TS report


    F3=Exit to CICS
```

Put an x here as well, and only used programs are shown

For quick snapshot of stats enter TS queue name and then view with CEBR

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Monitoring and Statistics - Online display

Sample display from DFH0STAT - looking at TS queue using CEBR

```
 Partition size established from ALLOC parameter . . :      26,111K
Storage BELOW 16MB

  Partition GETVIS area size under 16 Mb  . . . . . :       8,704K
    Partition GETVIS used area below 16 Mb  . . . . . :      6,680K
    Partition GETVIS free area below 16 Mb  . . . . . :      2,024K
    Partition GETVIS maximum used below 16 Mb . . . . :      8,704K
    Partition GETVIS largest free area  below 16 Mb . :      2,012K

Storage ABOVE 16MB
  Partition GETVIS area size above 16 Mb  . . . . . :      16,384K
    Partition GETVIS used area above 16 Mb  . . . . . :     13,636K
    Partition GETVIS free area above 16Mb . . . . . :        2,748K
    Partition GETVIS maximum used above 16 Mb . . . . :     13,888K
    Partition GETVIS largest free area above 16 Mb  . :      4,696K
```


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REXX/CICS

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Overview of REXX/CICS

- Interpretive execution of REXX EXECs within a CICS environment
- Supports most of the CICS API
- VSAM based file system for saving EXECs and Data files (RFS)
- Built in Editor for writing REXX EXECs and Data files
- VSE Librarian Sublibraries can be used to store EXECs
  - member type must be .PROC
- IMPORT/EXPORT between RFS and VSE Librarian sublibraries

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Overview of REXX/CICS *(continued)*

- New Commands can be written in REXX
- User and System commands can be defined from within REXX/CICS
- Support for System and user Profiles
- Shared Execs in Virtual Storage
- Interface to CEDA and CEMT transaction programs
  - results returned in REXX variables
- Support for TS and TD Queues
- Panel Support
- Support for BMS
- HELP - Online manual

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REXX/CICS - Limitations

- Does NOT provide an environment for REXX/VSE execs
  - No Address Power
  - No Address JCL
  - No EXECIO to SAM and VSAM libraries
- No Compiled REXX
- No SPI

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REXX File System

- Consists of FILEPOOLS
- Minimum of 2 required
- Unique 1 to 7 character name
- A FILEPOOL is two VSAM KSDS Clusters consisting of
  - DIR
  - DATA
    - *Control Intreval size must be at least 16K*
- Filepools needs to be formatted before being used
- Uses a directory structure similar to the VM Shared File System or PC
- User or Non-User FILEPOOL
- REXX File System commands are preceded with RFS
  - RFS COPY file_id1 file_id2

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REXX File System *(continued)*

- Each pool has a root directory
  - filepool_name:\
    - *POOL1:*
  - can contain files as well as subdirectories
- A USERS directory should exist in all USER FILEPOOLS
  - contains subdirectories for users on the system
- Subdirectories are created by the RFS MKDIR command
  - name is 1 to 8 characters with an optional extension following a dot
    - *USER1*
    - *USER1.INFO*
- Files are referenced by a fully qualified file id
  - consists of root, subdirectories, filename and membertype
    - *POOL1:\USERS\USER1\DEMO1.EXEC*

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REXX File System *(continued)*

- Owner can allow other users to access a directory
  - RFS AUTH command
    - *publicr*
    - *publicw*
    - *secured*
- Current Directory
  - use CD command to change
    - *'CD POOL1:\USERS\CICSUSER\COLINS\'*
- Path
  - defines search path for execs
  - current directory searched first
  - can contain multiple directories
    - *PATH POOL1:\ POOL1:\USERS\ POOL1:\USERS\USER1*

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Installing REXX/CICS

- REXX/CICS is only available on CICS Transaction Server for VSE/ESA
- Resource Definitions
  - *provided in DFHCUREX*
  - *LSRPOOL Definitions*
  - *Skeleton JCL for FILEPOOL definition*
- Library for the source file
- Minimum of two Filepools for the REXX File System (RFS)
- 35 Cylinders 3390 for help files
  - Default is POOL2

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Installing REXX/CICS (PTF)

- Upgrade CSD using DFHCUREX
- Use RDO to modify CICREXX group to meet your system requirements
  - Install using CEDA once modified
  - Add to a GRPLIST in your SIT so that it is automatically installed following a COLD START
- Copy and rename modules
  - Copy them to a library listed in your LIBDEF for CICS
  - Library must be in CICS LIBDEF PROC search chain
  - List supplied in PTF instructions
    - *Names begin CIC and need a member type of PROC*

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Installing REXX/CICS

- Update CICSTART.PROC
  - This is the System Profile Exec
  - Filepool formatting will fail with Return Code 4 if you do not do this
  - Change AUTHUSER RCUSER or add addtional lines to add userid that will logon to format the pools.
  - Use SYSA if no security is active
  - Change FILEPOOL definitions to meet your system requirements
- Update CICS Initialisation JCL if needed
  - Add LIBDEF for PROC if not already included
    - *// LIBDEF PROC,SEARCH=userlibrary*
  - If REXX is unable to find PROC library CICS REXX transactions will fail with
    - *CICREX490E Error 48 running CICSTART EXEC: Failure in system service*

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Installing REXX/CICS *(continued)*

- Update LRSPOOL definitions
  - use data buffers large enough to contain the control interval size
  - If the LSRPOOL is unable to support a key length of 252 and the control interval size you will get message
    - *4228I FILE RFSxxxx OPEN ERROR X'DC' (220)*
- Add DLBLs for RFS definitions if required.
- Create the FILEPOOLS
  - Implement as VSAM clusters
  - Sample JCL - CICVSAM.J is provided in PRD1.BASE

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Installing REXX/CICS *(continued)*

- Format the FILEPOOLS
  - Use a REXX authorised user
  - Start REXX transaction
  - Enter 'FILEPOOL FORMAT POOL1'
  - When complete enter SAY RC to check return code.
  - Repeat for the second Filepool
  - Reformatting a FILEPOOL will result in message
    - *Subcommand return code = 1836*
- If MORE appears in the bottom left of the screen whilst excuting REXX press the enter Key to clear the screen.

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Installing REXX/CICS *(continued)*

- FILEPOOL FORMAT command

```
Enter a REXX command or EXIT to quit
FILEPOOL FORMAT POOL1
SAY RC
0
FILEPOOL FORMAT POOL2
SAY RC
0

_                                                          READ
```

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Installing REXX/CICS *(continued)*

- Create the Help Files
  - Minimum EDSALIM of 20m
    - *make it at least 10M more than your current setting*
  - Copy and rename the files to your sublibrary
    - *Originals will be in PRD1.BASE*
    - *See installation instructions for details*
  - Enter REXX
  - Enter EXEC CICHREP
  - Respond to the messages with your sublibrary
  - The help files are created in the FILEPOOL defined in the CICSTART HELPPATH option.
- Verify the installation was successful
  - Enter CALL CICIVP1 from within CICS REXX.

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Installing REXX/CICS *(continued)*

- Creating the Help file
  - *Note that the entered data is not reflected back in the display*

```
EXEC CICHPREP
Please enter the Librarian sublibrary containing the REXX/CICS LIST3270.
(example: LIB.SUBLIB )
Please enter the Librarian sublibrary containing the HELP panels.
(example: LIB.SUBLIB )
17:47:32 Building INDEX and CHAPTER files.  Please be patient.
17:47:38 INDEX file built.
17:47:38 Building Chapter files
17:47:47 Chapter files are built
17:47:47 Building Appendix files.
17:47:48 Appendix files are built
17:47:48 34 Files built, all done !!




_                                                              READ
```


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Executing REXX/CICS EXECS

- From a Terminal
  - Use the REXX transaction and enter EXEC execname
    - *Interactive environment CICRXTRY*
    - *you can enter REXX commands directly*
    - *Enter EXIT to end*
  - Define as a TRANSACTION
    - *EDIT is a CICS transaction that brings up the REXX Editor*
- Using CICS START
  - If there is no associated terminal, then any terminal output is discard unless directed to a CICS TS queue
    - *If terminal input is requested an error is generated*
- Using CICS LINK or XCTL
  - Invoke the CICREXD interface.
    - *COMMAREA must be passed to the interface.*
    - *COMMAREA must contain the name of the exec and arguments*

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Using REXX/CICS

The Editor

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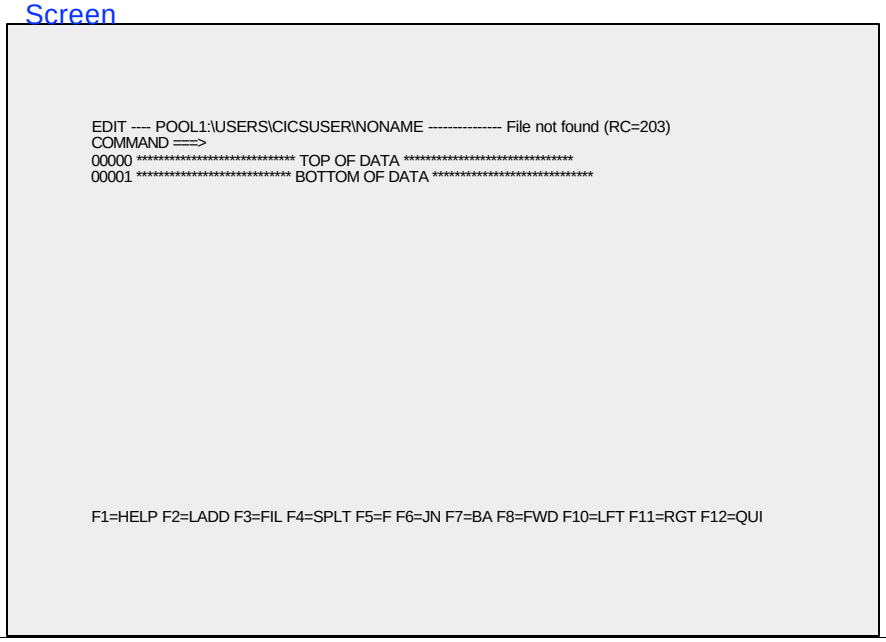
Using REXX/CICS - Editor

Basic Editor Screen



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Making the Most of CICS
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Using REXX/CICS - Editor

- can be invoked from a CLEAR CICS session by entering the EDIT transaction
  - similar to DITTO editor but can be customised
- can be used to edit REXX and data files
  - edited files are stored in the REXX Filepool System (RFS)
- does not support binary files
- supports prefix commands
  - *C, CC, M, MM, R, RR, '', "", B, A, I, F and P*
- can use macros
- CICEPROF.PROC
  - profile for the editor
  - Its a REXX exec so can be used to customise the editor

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Using REXX/CICS - Editor

- Example of an edit session

```
EDIT ---- POOL1:\USERS\CICSUSER\PANSAMP.PROC ---------- REXX/CICS Editor
COMMAND ===>
00000 ***************************** TOP OF DATA ******************************
00001 /* PROGRAM TO QUERY APPLICANT'S NAME AND ADDRESS */
00002 LNAME = '';  /* NULL OUT ALL NAME PARTS */
00003 FNAME = '';
00004 MI = '';
00005 MAIL_STREET = '';
00006 MAIL_CITY = 'DALLAS';  /* PREFILL THE MOST LIKELY RESPONSE FOR CITY/STATE
00007 MAIL_STATE = 'TX';
00008 MAIL_COUNTRY = 'USA' ;
00009 MAIL_ZIP = '';
00010 DO FOREVER;
00011   'PANEL SEND APPLICAN CURSOR(LNAME)';
00012   IF RC > 0 THEN
00013      CALL ERROR_ROUTINE;
00014
00015   'PANEL RECEIVE APPLICAN'; /* PSEUDO-CONVERSATIONAL THIS WOULD BE SEPARA
00016   IF PAN.AID = 'PF3' | PAN.AID = 'PF12' THEN
00017      LEAVE;
00018   IF PAN.AID = 'ENTER' & PAN.REA = 124 THEN
00019      ITERATE;
00020   IF PAN.AID = 'CLEAR' | SUBSTR(PAN.AID,1,2) = 'PA' THEN
F1=HELP F2=LADD F3=FIL F4=SPLT F5=F F6=JN F7=BA F8=FWD F10=LFT F11=RGT F12=QUI
```


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REXX/CICS - Command Environments

- There are 6 command environments suuplied with REXX\CICS
  - REXXCICS
  - CICS
  - EDITSVR
  - FLSTSVR
  - RFS
  - RLS
- Use ADDRESS to switch environment
  - Single Command
    - *ADDRESS CICS "READQ TSQ QUEUE('QUEUE1') INTO(VAR1)"*
  - All Commands
    - *ADDRESS CICS*

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REXX/CICS - CICS Environment

- Use CICS not EXEC CICS
- cannot handle
  - Handle Condition, Handle Aid, Handle Abend, Ignore Condition, Push and POP
- Syntax is the same as EXEC CICS
  - See Application Programmers Guide
- Data value fields can be literals or REXX variables
- Data area fields can be REXX variables
  - use different variables for source and target
- Length will be determined from REXX variable if not specified
- Always specify length on CICS ENQ command

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REXX/CICS - FLST Environment

- File List Utility (FLST) provides fullscreen interface to the REXX File System (RFS)

```
USER=CICSUSER - DIRECTORY=POOL1:\USERS\CICSUSER\
CMD    FILENAME FILETYPE ATTRIBUTES RECORDS      SIZE   DATE       TIME
       APPLICAN PANOBJ   FILE            1      1364   2000/04/07 12:31:01
       APPLICAN PANSRC   FILE           29       824   2000/04/07 12:30:42
       COLIN            DIR, PRIV                     2000/04/07 13:40:36
       DEMO     EXEC     FILE           33       802   2000/04/07 14:02:06
       MIKE             DIR, PRIV                     2000/04/07 14:01:29
       NEVILLE          DIR, PRIV                     2000/04/07 14:01:16
       PANSAMP  EXEC     FILE           33       802   2000/04/07 12:29:42
       SAMPLE   PANSRC   FILE           27       803   2000/04/07 12:01:43









COMMAND ===>

F1=HELP F2=REFRESH F3=END F7=UP 18 F8=DOWN 18 F11=EDIT F12=CANCEL
```


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REXX/CICS - FLST Environment *(continued)*

- Enter commands against the file
  - rename / test.exec
- Enter Refresh on command line or use the REFRESH PF Key to update display
- To sort list use the SORT command on the command line
  - SORT option
    - *DT sorts by date and time*
    - *FN sorts by name*
    - *FT sorts by type*
    - *AT sorts by attribute*
    - *RC sorts by number of records*
    - *SZ sorts by size*
- Subdirectories are included in the list
- Default key to execute an exec is X
- Default to edit a file is EDIT

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REXX/CICS - FLST Environment *(continued)*

- CICFPROF.PROC is system profile
- FLSTPROF.PROC can be used to override system profile.
- To execute commands in the FLST environment use ADDRESS FLSTSVR
- When defining synonyms there is no minimum length option
  - To define a synonym for LOCATE that accepts 3 or more characters you need 4 synonym definitions
    - *DEFINE SYNONYM LOCATE*
    - *DEFINE SYNONYM LOCAT*
    - *DEFINE SYNONYM LOCA*
    - *DEFINE SYNONYM LOC*

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REXX/CICS - RLS

- REXX List System provides capability for data in list or table to be loaded into virtual storage
- RLS and CLD are used instead of RFS and CD
- First invocation creates a TS queue called *CICREX* which contains the anchor address
- Route directory is \ and it always has a USERS subdirectory.
- Commands are authorised
- Move data between a REXX stem variable and an RLS file by using
  - RLS READ and RLS WRITE
- Move data between a REXX Variable and a RLS file using
  - RLS VARGET and RLS VARPUT
- Special commands for accessing RLS queues
  - RSL LPULL, RLS LPUSH and RLS LQUEUE

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REXX/CICS - Panels

- Simple Panel support
- Panels are defined in RFS
  - membertype is PANSRC
- When first used or after editing, REXX generates a file with a membertype of PANOBJ
- Use PANEL command in EXEC to display panel and to read results.

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REXX/CICS - Storage Commands

- 'CICS GETMAIN SET(varname) LENGTH(xx) INITMSG(ZEROES)'
- COPYR2S var1 varname datalength

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REXX/CICS - BMS

- Assembled Mapset must be in the CICS LIBDEF chain
- The BMS map must be assembled to produce a map DSECT
- The Map Dsect can be converted using CONVTMAP
- Maps must be defined to CICS using Resource Definition Online
- To read or send data to the screen, GETMAIN CICS storage for the Map input/ouput area
  - Storage must be initialised to nulls
- If a field is referenced by multiple labels, use the last one

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Summary

- We have only covered some of the new features introduced with CICS Transaction Server, which
  - Are easy to implement
  - Bring great benefits
  - Result in easier management of CICS systems
  - A reduction in system resource usage
  - Result in improved statistics reporting
  - Improved monitoring data collection
  - and REXX for CICS
- There are numerous other enhancements, certainly too many to cover today

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Making the most of CICS Transaction Server

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Appendix

Appendix

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Automatic journal archive - skeleton JCL

- The skeleton JCL is passed the following symbolic parameters:
  - &SYST — A 4-byte identifier of the CICS region issuing the journal archive job, derived from the SYSIDNT system initialization parameter.
  - &JJ — A 2-digit journal identification (JFILEID), in the range 01 through 99.
  - &D — A 1-character dataset identification: A or B.
  - &JOURDSN — A 1- to 44-byte journal dataset name.
  - &ODATE — A 7-byte journal dataset open date (yyyyddd).
  - &OTIME — A 7-byte journal dataset open time (hhmmsst).
  - &CDATE — A 7-byte journal dataset close date (yyyyddd).
  - &CTIME — A 7-byte journal dataset close time (hhmmsst).
  - &JACDDSN — A 1- to 44-byte JACD dataset name.
  - &APPLID — A 1- to 8-byte CICS APPLID. Note that for an XRF system this is the generic, not the specific, APPLID.

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Automatic Journal Archive - Parameter handling

- Parameter substitution by DFHJASP
  - You code the skeleton JCL with substitutable characters as follows

```
$$$$ JOB JNM=ARCHTEST,CLASS=0
// JOB ARCHTEST Archive CICSTEST Journal Dataset
$$/* Step 1 : Check journal status
// DLBL DFHJACD,'&JACDDSN',,VSAM,CAT=VSESPUC
etc.
$$/&
$$$$ EOJ
```

  - which are changed by DFHJASP on submission to look something like

```
* $$ JOB JNM=ARCHTEST,CLASS=0
// JOB ARCHTEST Archive CICSTEST Journal Dataset
// SETPARM SYST=CICT
// SETPARM JJ=01
// SETPARM D=A
// SETPARM JOURDSN='CICSTEST.JOURNAL.A'
// SETPARM ODATE=1998001
// SETPARM OTIME=0600013
// SETPARM CDATE=1998001
// SETPARM CTIME=1825142
// SETPARM JACDDSN='CICSTEST.DFHJACD'
// SETPARM APPLID=CICSTEST
/* Step 1 : Check journal status
// DLBL DFHJACD,'&JACDDSN',,VSAM,CAT=VSESPUC
etc.
/&
* $$ EOJ
```


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External CICS Interface - Sample JCL

```
// JOB ASSEMBLE EXCI PROGRAM
// DLBL IJSYSPH,'TRANSLATION.WORKFILE',0
// EXTENT SYSPCH,,1,0,nnn,mm
ASSGN SYSPCH,SYS001
// LIBDEF *,SEARCH=PRD1.BASE
// LIBDEF PHASE,CATALOG=user.sublibrary
// OPTION CATAL
// EXEC DFHEAP1$,PARM='EXCI'
*ASM XOPTS(EXCI)
<<<< SOURCE STATEMENTS HERE >>>>
/*
*  TESTWB COMPILER STEP
CLOSE SYSPCH,00D
// DLBL IJSYSIN,'TRANSLATION.WORKFILE',0
// EXTENT SYSIPT
ASSGN SYSIPT,SYS001
// OPTION CATAL
 PHASE phase_name,*
// LIBDEF *,SEARCH=(PRD1.BASE,user.sublibraries)
// EXEC ASMA90,SIZE=(ASMA90,50K)
CLOSE SYSIPT,SYSRDR
  INCLUDE DFHXCSTB
// EXEC LNKEDT,SIZE=128K,PARM='AMODE=31,RMODE=24'
/*
/&
```


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Monitoring and Statistics - DMF start up

- CATALOG=, Use IJSYSUC
  FILELIST=(CICS410.SYS1.MANY,CICS410.SYS1.MANZ),
  INTERVAL=3000, 30 minutes 0 seconds
  LISTDSN=YES, Show datasets when DMF starts
  SID=3090, System identifier
  SIZE=4, Use a 4M data space
  STATUS=ACTIVE, DMF is active at start
  SUFFIX=SU, This table is called DFHDMFSU
  TRACE=NO, No trace activity
  TRTABSZ=1024, Trace table size is 1M
  TYPE=0:255, Record all DMF data record types
  USAGE=50 Reduce space when 50% full

Alternative to FILELIST:
GENFILES=nn will generate nn files (up to 36)
with default prefix CICS410.SYS.MAN
and optionally
GENPREFIX=prefix
can over-ride default prefix

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Monitoring and Statistics - Define DMF files

- Use IDCAMS - e.g.

```
DEFINE CLUSTER (NAME(CICS410.SYS1.MANY)
NONINDEXED -
VOLUME(vvvvvv) -
CYLINDERS(10)  -
REUSE -
RECORDSIZE(125  32767)
SPANNED -
CONTROLINTERVALSIZE(8192) -
SHAREOPTIONS(2) ) -
CATALOG(user VSAM catalog)
```

Essential

This catalog must contain all the DMF data sets

- Repeat for each data set

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Monitoring and Statistics - Initialize DMF files

- Use DFHDFOU

```
// DLBL DFHDCAT,'CICS410.USERCAT',,VSAM
// DLBL ddname1,'CICS410.SYS1.MANY',,VSAM,
     CAT=DFHDCAT
// DLBL ddname2,'CICS410.SYS1.MANZ',,VSAM,
     CAT=DFHDCAT
// EXEC DFHDFOU
INDD ( ddname1 , Options (clear) )
INDD ( ddname2 , Options (clear) )
/*
```

These names must match (max 7 chars)

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Monitoring and Statistics - DMF startup JCL

- Use the following as a sample

```
// JOB DFHDFSIP
// OPTION NOSYSDUMP
// DLBL IJSYSUC,'user VSAM catalog',,VSAM
// LIBDEF *,SEARCH=PRD1.BASE
// EXEC DFHDFSIP,SIZE=600K,OS390
SUFFIX = SU
/*
// EXEC LISTLOG
/&
```

Use OPTION SYSDUMP to get an SDUMP in the event of a failure

Specify the VSAM catalog that contains the DMF data sets

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Monitoring and Statistics - DMF commands

- You request communication with DMF by entering MSG pn where pn is the partition in which DMF is running. DMF will respond with DFHDF0000 Enter command, to which you may enter one of the following
- Valid commands for DMF are:
  - DISPLAY - display file status
  - DISPLAY O - display operating status
  - SETDMF ACTIVE - start recording data
  - SETDMF FLUSH - write data out to data set
  - SETDMF INTERVAL(mmss) - change wakeup interval
  - SETDMF NOACTIVE - stop recording data
  - SETDMF NOTRACE - stop recording trace
  - SETDMF SHUTDOWN - terminate DMF in a controlled manner
  - SETDMF SHUTDOWN,I - terminate DMF in a less controlled manner
  - SETDMF SWITCH - switch to another data set
  - SETDMF TRACE - start recording trace
  - SETDMF DEBUG,[ON|OFF] - enables|disables debug facility
- Alternatively, enter MSG pn,DATA=command

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Monitoring and Statistics - Offload DMF data sets

- Offloading the CICS SMF 110 records from DMF
  - DMF utility - DFHDFOU

```
// JOB DFHDFOU
// OPTION PARTDUMP
// DLBL PACC0F,'PACC07.UCAT',,VSAM
// DLBL INDD1,'CICS410.SYS1.MANY',,VSAM,CAT=PACC0F
// DLBL INDD2,'CICS410.SYS1.MANZ',,VSAM,CAT=PACC0F
// DLBL OUTDD1,'TEST.DMF.OUTPUT',0
// LIBDEF *,SEARCH=(PRD1.BASE)
// EXEC DFHDFOU,SIZE=DFHDFOU
   INDD ( indd1, Options (dump))
   INDD ( indd2, Options (dump))
   OUTDD ( outdd1, type( 110 ))
/*
```

Note:
JCL is
incomplete

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Monitoring and statistics - DFH$MOLS sample JCL

Monitoring sample program - DFH$MOLS

How do I print the performance class data from multiple systems using DFH$MOLS?

```
// JOB DFHDFOU
// OPTION PARTDUMP
// DLBL PACC0F,'PACC07.UCAT',,VSAM
// DLBL INDD1,'CICS410.SYS1.MANY',,VSAM,CAT=PACC0F
// DLBL OUTDD1,'TEST.DMF.OUTPUT',0
// LIBDEF *,SEARCH=(PRD1.BASE,PRD3.PROD)
// EXEC DFHDFOU,SIZE=DFHDFOU
INDD ( indd1, Options (dump))
OUTDD ( outdd1, type( 110 ))
/*
// DLBL PACC0F,'PACC07.UCAT',,VSAM
// DLBL INPUT01,'TEST.DMF.OUTPUT',0
// DLBL SORTWK1,'SORT.WORK.FILE.1',0,SD
// EXEC DFH$MOLS,SIZE=2M
PRINT PER          <-- Print performance class
...
Control statements for data selection
...
SORT               <-- Must be specified for multiple systems
/*
```


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Monitoring and statistics - DFHSTUP sample JCL

- DFHSTUP - Summary report
  - Reconstructs the shutdown view of statistics using
    - *Unsolicited, interval, end-of-day and requested reset data*
  - Reconstructs ALL the data for all statistics reports for each applid for a given date/time selection regardless of the collection type

```
// JOB DFHSTUP
// DLBL SORTWK1,'TEST.SORT.WORK,0,SD
// DLBL DFHSTAT,'TEST.DMF.OUTPUT',0,SD
// DLBL DFHSTWK,'TEST.STAT.WORK',0,SD
// EXEC DFHSTUP,SIZE=2M,OS390
 SORT WORK=1
 SELECT APPLID=(applid1,applid2)
 SELECT TYPE=(DISPATCHER,PROGRAM,STORAGE,TRANSACTION,TSQUEUE)
SUMMARY
/*
```


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