CICS Transaction Server for z/OS
Version 4 Release 2

System Definition Guide

SC34-7185-01

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Note

Before using this information and the product it supports, read the information in "Notices" on page 417.

This edition applies to Version 4 Release 2 of CICS Transaction Server for z/OS (product number 5655-S97) and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Preface

What this book is about

This book is intended to help you specify and install the system definitions and resources for a CICS® system. It contains guidance about the system definitions required to run a CICS system in an IBM® MVS™ environment.

Who should read this book

This book is for system programmers responsible for specifying and installing the system definitions and resources for a CICS system.

What you need to know to understand this book

You should have experience of the MVS operating system, and either have previous experience of CICS, or at least be familiar with the concepts and terminology. To understand the jobs required to install CICS resource definitions, you should be familiar with MVS job control language (JCL) and cataloged procedures.

How to use this book

The parts and chapters of this book are self-contained. Use an individual part or chapter where it contains information about the particular task you are engaged in.

Notes on terminology

"CICS" is used throughout this book to mean the CICS element of the IBM CICS Transaction Server for z/OS®, Version 4 Release 2.

"RACF" is used to mean the IBM Resource Access Control Facility (RACF) or any other external security manager that provides equivalent function.

In the programming examples in this book, the dollar symbol ($) is used as a national currency symbol and is assumed to be assigned the EBCDIC code point X'5B'. In some countries a different currency symbol, for example the pound symbol (£), or the yen symbol (¥), is assigned the same EBCDIC code point. In these countries, the appropriate currency symbol should be used instead of the dollar symbol.

"MVS" is used throughout this book to mean the MVS operating system.

Book structure

The book consists of the following parts.

Part1. Defining data sets
Describes the data sets needed by the various CICS facilities. Each chapter describes the facility, its function and usage, and the data sets required to implement it in a running CICS region.

Part 2. System initialization
Describes the system initialization parameters. that you can code to initialize a CICS region tailored for your installation.

Part 3. Initializing CICS data sharing servers
Describes how to set up and start CICS data sharing servers.

Changes in CICS Transaction Server for z/OS, Version 4 Release 2

For information about changes that have been made in this release, please refer to *What's New* in the information center, or the following publications:

- *CICS Transaction Server for z/OS What's New*
- *CICS Transaction Server for z/OS Upgrading from CICS TS Version 4.1*
- *CICS Transaction Server for z/OS Upgrading from CICS TS Version 3.2*
- *CICS Transaction Server for z/OS Upgrading from CICS TS Version 3.1*

Any technical changes that are made to the text after release are indicated by a vertical bar (|) to the left of each new or changed line of information.

Part 1. Defining data sets

These topics describe the CICS system data sets needed to support various CICS facilities, such as temporary storage, transient data, transaction dump, trace, and so on. Some of these data sets are optional, others are required in order to run CICS. If a data set needs preformatting, a job that you can use for this purpose is shown.

The CICS facilities and their data sets are dealt with in the following sections:

- Chapter 1, “Setting up CICS data sets,” on page 3
- Chapter 2, “Setting up temporary storage data sets,” on page 13
- Chapter 3, “Setting up data sets for transient data,” on page 17
- Chapter 4, “Setting up CICS log streams,” on page 23
- Chapter 5, “Setting up the CICS system definition data set,” on page 37
- Chapter 6, “Setting up the catalog data sets,” on page 59
- Chapter 7, “Setting up auxiliary trace data sets,” on page 71
- Chapter 8, “Defining dump data sets,” on page 75
- Chapter 9, “Defining user files,” on page 81
- Chapter 10, “Defining the CDBM GROUP command data set,” on page 95
- Chapter 11, “Defining the CMAC messages data set,” on page 99
- Chapter 12, “Defining the EJB data sets,” on page 101
- Chapter 14, “Setting up the debugging profiles data sets,” on page 107
- Chapter 26, “CICS server support for system-managed processes,” on page 411

Chapter 1. Setting up CICS data sets

You must define a number of data sets to run CICS. Some of these data sets are mandatory, whereas others are needed only if you are using the corresponding facilities. You might also need to provide data set definitions for user files, DL/I databases, and terminals other than z/OS Communications Server terminals.

About this task

Procedure

1. Plan what CICS data sets you require.
   a. Review the CICS facilities that you want in your CICS regions and their data set requirements.
   b. Define a naming convention for your data sets.
   c. Calculate the space to allocate to the data sets and the data definition statements to define them to the running CICS region.
2. Define and catalog the data sets that are used by CICS.
3. If required, initialize or preformat the data sets that are used by CICS.
4. Protect the data sets with an external security manager, such as RACF®, to suit your security requirements.
5. Define the DD statements for the required data sets in the CICS startup job stream. You do not have to define DD statements for the following data sets:
   - User files for which you are using CICS dynamic allocation facilities
   - CICS system data sets that are managed by CICS file control and for which you are using CICS dynamic allocation facilities
   - DL/I databases you are accessing through CICS remote DL/I support or DBCTL

   For more information about user file definitions, see Chapter 9, "Defining user files," on page 81.

What to do next

When you have defined the CICS data sets, you can use CICS utility programs to perform postprocessing on the data sets. These utilities are described in theThe CICS utility programs in the Operations and Utilities Guide.

Reviewing the CICS data sets

Review the list of mandatory and optional data sets to select which ones to create in your CICS regions.

Procedure

1. You must define the following CICS data sets:

Data set	DDNAME	Block or CI size (bytes)	Record format	Data set organization
Auxiliary trace (See Setting up and using auxiliary trace data sets)	DFHAUXT DFHBUXT	4096	F	Sequential

Data set	DDNAME	Block or CI size (bytes)	Record format	Data set organization
BTS local request queue. (See *CICS Business Transaction Services*)	DFHLRQ	1024 and 2560	VB	VSAM KSDS
Catalogs (See Setting up and using catalog data sets)	DFHGCD DFHLCD	8192 & 2048	VB	VSAM KSDS
CSD (See Setting up the CICS system definition data set)	DFHCSD	8192	VB	VSAM KSDS
Dump (See Defining dump data sets)	DFHDMPA DFHDMPB	32 760 (tape) or 1 track (DASD)	V	Sequential
Messages and codes (See Defining the CMAC messages data set)	DFHCMACD	—	V	VSAM KSDS
Temporary storage (See Setting up the temporary storage data set)	DFHTEMP	See Control interval size of temporary data set	N/A	VSAM ESDS
Transient data extrapartition (See "Defining extrapartition data sets" on page 20)	From the DDNAME option in the resource definition	From the BLOCKSIZE option in the resource definition	From the RECORD FORMAT option in the resource definition	Sequential
Transient data intrapartition (See "Defining the intrapartition data set" on page 17)	DFHINTRA	See "Size of the intrapartition data set" on page 19	N/A	VSAM ESDS

Temporary storage and transient data intrapartition data sets use control interval (CI) processing and therefore the record format is not relevant.

2. You must define the following CICS data sets if you plan to use the equivalent functions:

Data set	DDNAME	Block or CI size (bytes)	Record format	Data set organization	Function
CAVM control	DFHXRCTL	4096 minimum	N/A	VSAM ESDS	Required if running CICS with XRF.
CAVM message	DFHXRMSG	4096 minimum	N/A	VSAM ESDS	Required if running CICS with XRF.
CDBM group command	DFHDBFK	8192	VB	VSAM KSDS	See Defining the CDBM GROUP command data set
DJAR mapping file	DFHADJM	8192	F	VSAM KSDS	Required for CICS EJB development deployment tool only. This data set must not be shared. See Chapter 12, "Defining the EJB data sets," on page 101

Data set	DDNAME	Block or CI size (bytes)	Record format	Data set organization	Function
EJB directory	DFHEJDIR	1024	F	VSAM KSDS	Required only for use by the regions (listeners and AORs) in a logical EJB server. This data set must be shared by all the regions in the EJB server. See Chapter 12, "Defining the EJB data sets," on page 101
EJB object store	DFHEJOS	8192	F	VSAM KSDS	Required only for use by the regions (listeners and AORs) in a logical EJB server. This data set must be shared by all the regions in the EJB server. See Chapter 12, "Defining the EJB data sets," on page 101

The CAVM control and message data sets use control interval (CI) processing and therefore the record format is not relevant.

Example

What to do next

Defining a data set naming convention

There are no restrictions on the data set names you choose for CICS data sets, other than MVS constraints. In this information, CICSTS42.CICS is used as the high-level qualifier, and the DD name as the lowest level. If you are running multiple CICS regions, you can use the CICS APPLID as a second level qualifier.

About this task

If the data set is shared between an active CICS region and an alternate CICS region, use the generic APPLID, but if the data set is unique to either the active or the alternate CICS region, use the specific APPLID.

Procedure

- For 4-character names, use the *CTGI* naming convention, as described in *z/OS Parallel Sysplex Application Migration*. It is based on the 4-character *CTGI* symbol, where:
  - C identifies an entire CICSplex
  - T identifies the type of region
  - G identifies a group of regions
  - I identifies iterations of regions within a group
- For 8-character names, as for CICS APPLIDs, use the letters CICS for the first four characters, particularly for production regions. For example, if CICSHTH1 is the APPLID, the data set name for the CSD would be:

```
DFHCSD   DD  DSN=CICSTS42.CICS.CICSHTH1.DFHCSD,DISP=SHR
```

Defining data sets with multiple extents and volumes

You can define a temporary storage data set or a transient data destination data set, as a single extent defined on a single volume. That data set must be big enough to hold all your data.

Instead of defining one data set, which to cater for exceptional cases might have to be much larger than your average, you can define:
- Multiple extents on one volume
- One extent on each of multiple volumes
- Multiple extents on multiple volumes

When you define more than one extent, CICS uses the extra extents only when the primary extent is full. You could make your primary extent large enough to meet average demand, and then have smaller secondary extents for overflow. In this way, you save space until it is needed. When each extra extent becomes full, VSAM creates another. VSAM continues to create extra extents, as needed, up to a maximum of 123 extents. The use of multiple volumes has no effect on this limit.

To allocate additional extents in the same volume, code a secondary extent operand on the RECORDS parameter:

```
RECORDS(primary,secondary)
```

To use single extents on multiple volumes, code:

```
RECORDS(primary) -
VOLUMES(volume1,volume2,volume3,.....)
```

For multiple extents on multiple volumes, combine both primary and secondary RECORDS operands with multiple VOLUMES operands:

```
RECORDS(primary,secondary) -
VOLUMES(volume1,volume2,volume3,.....)
```

If a particular volume causes performance bottlenecks, try single extents on multiple volumes.

Use multiple extents over multiple volumes if there is a probability that a volume will exhaust its free space before VSAM reaches its limit on extra extents. If this occurs, VSAM continues to create extra extents on the next volume in the list.

Creating the CICS data sets

You can use CICS-supplied jobs to create the CICS data sets.

About this task

When you ran the DFHISTAR job as part of the CICS installation, these jobs were tailored to your environment and stored in the library that you specified on the **LIB** parameter of the DFHISTAR job. The default is CICSTS42.XDFHINST).

You can generate several copies of these jobs by rerunning the DFHISTAR job, selecting the jobs that you want to copy. To generate new copies of these jobs, edit the DFHISTAR job to specify new values for the **DSINFO** and **SELECT** parameters. Only those jobs that you name by the **SELECT** parameter are regenerated.

Procedure

1. Run the DFHCOMDS job to create the CICS region definition data set, DFHCSD, and the SYSIN data set.
2. Run the DFHDEFDS job to create data sets used only by one CICS region. You must run a separate copy of this job to create the data sets for each CICS region. This job creates the following data sets:

Data set	Description
DFHADEM	Resource manager for enterprise beans
DFHAUXT	Non-VSAM auxiliary trace (A) data set
DFHBRNSF	Bridge
DFHBUXT	Non-VSAM auxiliary trace (B) data set
DFHDMPA	Non-VSAM dump (A) data set
DFHDMPB	Non-VSAM dump (B) data set
DFHDPFMB	The debugging profiles base data set
DFHDPFMP	The debugging profiles path data set
DFHDPFMX	The debugging profiles path data set
DFHEJDIR	EJB directory
DFHEJOS	EJB object store
DFHGCD	CICS global catalog
DFHHTML	HTML template data set
DFHINTRA	Intrapartition transient data set
DFHLCD	CICS local catalog
DFHLRQ	BTS local request queue
DFHPIDIR	WS-AT directory data set
DFHTEMP	Temporary storage data set
FILEA	Sample program file

3. Run the DFHCMACI job to create the CICS messages data set, DFHCMACD, and load it with the data from the CICS-supplied file, DFHCMACD, in the CICSTS42.CICS.SDFHMSGS target library.

Sizing the MVS system data sets

Besides its own system data sets, CICS also uses some MVS data sets.

About this task

These data sets are:

Data set	Owned or used by	Other comments
SDUMP data sets	MVS SDUMP macro	Used by CICS for system dumps through the MVS SDUMP macro.
SMF data sets	System management facility	Used by CICS monitoring and statistics domains for monitoring and statistics records.

Data set	Owned or used by	Other comments
GTF data sets	Generalized trace facility	Used by CICS trace domain for CICS trace entries.

Procedure

1. Recalculate the size of these system data sets, taking into account the increased volumes of data that CICS generates. For example, for an SDUMP data set you must have at least 25 cylinders of a 3380 device, or the equivalent. For guidance information about calculating the size of SDUMP data sets, see the *z/OS MVS Initialization and Tuning Guide*.
2. To prevent the SDUMP data sets from becoming full of unwanted SDUMPs, suppress the SDUMPs as described in “Suppressing system dumps that precede ASRx abends” on page 76. SDUMPs can precede ASRA, ASRB, and ASRD abends after the message DFHAP0001.
3. If you are collecting CICS interval statistics frequently, or the volume of statistics at each interval is high, then you must take this into account when sizing your SMF data sets.

   CICS can write records to SMF of up to 32 756 bytes, resulting in SMF writing spanned records to the SMF data sets. For more efficient use of DASD, you should consider creating the SMF data sets to be used by CICS with a control interval size of either 16 384 bytes (16 KB) or 8192 bytes (8 KB). If you use other control interval sizes you must consider the trade-off between efficient use of DASD, SMF data set I/O performance, and the possibility of data being lost due to insufficient SMF buffers.
4. If you are collecting CICS monitoring data, you must size the amount of data that is written when the monitoring classes are active. For background information about SMF, and about other SMF data set considerations, see the *z/OS MVS System Management Facilities (SMF)*.
5. If you are running CICS with GTF trace on, make allowance for CICS trace entries in the GTF data sets. For background information about GTF, see *z/OS MVS Diagnosis: Tools and Service Aids*.

Defining backup while open (BWO) for VSAM files

CICS supports the backup while open (BWO) facility provided by DFSMSdss and DFSMShsm. This support enables some types of VSAM data sets to be backed up by DFSMSdss while CICS is currently updating these data sets.

At the same time, CICS logs forward recovery images of any changes to these data sets on a forward recovery journal. At a later date the backup of the data set can be restored using DSMShsm and brought to a point of consistency by applying the forward recovery logs using a forward recovery utility such as CICS VSAM Recovery.

Before you begin

BWO is available only for data sets accessed by CICS file control, which includes the CICS system definition (CSD) data set. You must decide which VSAM user data sets are eligible for BWO, subject to the restrictions detailed in “Restrictions on BWO” on page 10 that are applicable to heavily-updated KSDS data sets.

VSAM data sets that are to use this facility must reside on SMS-managed DASD, and must have an ICF catalog structure. Only VSAM ESDS, RRDS (both fixed and variable), and KSDS data sets are supported.

About this task

For DFSMS 1.3, there are two ways of defining BWO:

Procedure

- Define the cluster with parameter **BWO**=TYPECICS. This value means that the cluster is eligible for BWO in a CICS region. The file resource definition is ignored, even if it conflicts.

  Clusters with data sets that are to be opened in RLS mode must have BWO specified in the cluster definition.
- If the BWO parameter is not defined, it defaults to UNDEFINED. In this case, CICS looks at the file resource definition.

  CICS defines a data set as eligible for BWO when a file is defined using RDO. If BACKUPTYPE=DYNAMIC is specified for a VSAM file, the file is defined as eligible for BWO when the data set is opened.

  If DFSMSdss is to back up a data set that is specified with BACKUPTYPE=STATIC, all CICS files currently open for update against that data set must be closed before the backup can start.

Results

CICS records the fact that a VSAM base cluster data set is eligible for BWO in its base cluster block. This is remembered when all files have closed against the VSAM base cluster and across CICS warm and emergency restarts. It is not remembered across CICS cold or initial starts.

What to do next

You must put appropriate procedures into place for BWO and for forward recovery. These procedures must include:
- Restoring the BWO backup and running the forward recovery utility to bring the data set to a point of consistency. The restore requires that users do not have access to the file during the recovery process.
- Restoring and forward recovery of data sets that might have been damaged while allocated to CICS. This operation might require backout of partially committed units of work, by CICS emergency restart.

Effect of disabling activity keypointing

If you disable activity keypointing in your CICS region by specifying the system initialization parameter **AKPFREQ**=0, there is a serious effect on BWO support for non-RLS activities.

When activity keypointing is disabled, no tie-up records (TURs) are written to the forward recovery logs and the data set recovery point is not updated. Therefore, forward recovery of a BWO backup must take place from the time that the data set was first opened for update. This requires that all forward recovery logs are kept since that time so that forward recovery can take place. If there are many inserts or records that change length, a lot of forward recovery could be required. If, however, a record is just updated and the length is unchanged, there is no CI split.

For information about TURs and recovery points, see the *CICS Recovery and Restart Guide*.

Restrictions on BWO

The following restrictions apply to VSAM KSDS data set types only.

If a VSAM control interval or control area split occurs while a BWO is in progress, the backup is unreliable and is discarded by DFHSM and DFDSS. During such a split, certain portions of the data set may be duplicated or not represented at all in the backup as DFDSS copies sequentially. MVS/DFP 3.2 indicates that a split has occurred in the ICF catalog. At the end of the backup, DFHSM and DFDSS check the ICF catalog, and if a split has occurred, or is still in progress, discard the backup. For this reason, certain heavily-updated VSAM KSDS data sets may not be eligible for BWO, or might be eligible only during periods of reduced activity (for example, overnight). For a KSDS data set to be eligible for BWO, the typical time between control interval or control area splits must be greater than the time taken for DFHSM and DFDSS to take a backup of the data set.

Using storage management facilities

BWO requires a number of storage management facilities.

About this task

These storage management facilities are :

- Storage management subsystem (SMS), part of MVS/DFP Version 3 Release 2 or later, product number 5665-XA3.
- Data facility hierarchical storage manager (DFHSM), product number 5665-329.
- Data facility data set services (DFDSS), product number 5665-327.

For more information about these facilities see the following sections.

Storage management subsystem (SMS)

SMS is the approach to DASD storage management in which CICS, by means of the storage management subsystem, determines data placement. In addition, an automatic data manager handles data backup, movement, space, and security.

This is sometimes referred to as DFSMS and complements functions of MVS/DFP and other individual products of the Data Facility product family. For more details about SMS, see the following publications:

- *MVS/DFP Version 3 Release 2: Storage Administration Reference*, SC26-4566

  This describes storage administrator applications.
- *MVS/DFP Version 3 Release 2: General Information*, SC26-4552

  This gives an overview of MVS/DFP and its requirements and describes concepts of SMS-managed storage.

Message on recall of backed up data sets

If you use DFHSMS to manage your VSAM data sets, you should consider carefully the period after which your CICS VSAM data sets are migrated to primary or secondary storage.

If a migrated data set has to be recalled for CICS, it can take several minutes from primary storage, or longer from secondary storage. While the recall is taking place, the user is locked out, and no other opens or closes on that data set can be performed until the data set has been recalled.

If a migrated data set has to be recalled, CICS issues message DFHFC0989 to the system console, to notify the user that a recall is taking place, and to indicate whether it is from primary or secondary storage.

Data facility hierarchical storage manager (DFHSM)

DFHSM is an IBM-licensed program to manage volumes and data sets.

For more details about DFHSM, see the *Data Facility Hierarchical Storage Manager Version 2 Release 5.0: General Information*, GH35-0092. This manual discusses the main features, options, and potential benefits of DFHSM, and addresses people who want to know what the DFHSM program can do for them.

Data facility data set services (DFDSS)

DFDSS is an IBM-licensed program used to copy, move, dump, and restore data sets and volumes.

For more details about DFDSS, see the *Data Facility Data Set Services Version 2 Release 5.0: General Information*, GC26-4123. This manual introduces DFDSS and helps you evaluate its use.

Chapter 2. Setting up temporary storage data sets

Each CICS region uses an area of 64-bit (above the bar) or 31-bit (above the line) storage in the CICS region as main temporary storage. You can define some auxiliary temporary storage for the CICS region in a nonindexed VSAM data set. Applications in a CICS region can also use shared temporary storage pools in a z/OS coupling facility.

About this task

For an overview of the different temporary storage locations and the features available for temporary storage queues in each location, see the *CICS Performance Guide*.

Compared to main temporary storage, auxiliary temporary storage is typically used by applications that store data for longer periods, or access the data less frequently. Temporary storage queues in auxiliary storage can also be defined as recoverable, which enables you to maintain data from one CICS run to the next. Temporary storage queues in main storage cannot be defined as recoverable.

Shared temporary storage pools in a coupling facility require temporary storage servers, typically one server in each z/OS image in the sysplex. However, they do not use any storage in the CICS region. Access to temporary storage queues in shared temporary storage pools is quicker than access to temporary storage queues held by a remote CICS region (queue-owning region). Shared temporary storage pools do not cause intertransaction affinities. For more information, see "Defining temporary storage pools for temporary storage data sharing" on page 328.

Defining the auxiliary temporary storage data set

You can either define a VSAM data set for auxiliary temporary storage as a single extent data set on a single volume using the sample job described here, or use the CICS-supplied job DFHDEFDS. DFHDEFDS creates the DFHTEMP data set as one of the data sets for a CICS region.

About this task

You must not define any extra associations for a temporary storage data set. For example, do not define a PATH. Doing so causes CICS startup to fail. Do not allocate the DFHTEMP data set from an SMS data class using extended addressability because CICS does not support this.

Procedure

1. Consider adding multiple extents and multiple volumes for the data set. The sample job produces a single-extent data set defined on a single volume, but you might experience channel and arm contention if auxiliary temporary storage is used heavily. To use DASD space more efficiently, you could define the DFHTEMP data set with a primary extent large enough for normal activity, and with secondary extents for exceptional circumstances, such as unexpected peaks in activity. For instructions to define further extents or volumes, see "Defining data sets with multiple extents and volumes" on page 6.

2. Specify a **RECORDSIZE** value that is 7 bytes less than the **CONTROLINTERVALSIZE**. You must specify the amount of space for temporary storage in two values:
   a. The control interval size. See "Control interval size for auxiliary temporary storage" for information about how to calculate the space.
   b. The number of control intervals in the data set. See "Number of control intervals for auxiliary temporary storage" on page 15 for information about how to set the correct number of control intervals.
3. Add a data definition statement for the DFHTEMP data set to the startup job stream. The temporary storage data set is a passively shared data set, owned by the active CICS region, but allocated to both the active and alternate CICS regions. Although the alternate CICS region does not open this data set before takeover, it is allocated at job step initiation, so you must specify DISP=SHR on the DD statement to enable the alternate CICS region to start.

   ```
   //DFHTEMP  DD  DSN=CICSTS42.CICS.applid.DFHTEMP,DISP=SHR
   ```

Example

```
//DEFTS    JOB accounting info,name
//AUXTEMP  EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//SYSIN    DD  *
   DEFINE CLUSTER(NAME(CICSTS42.CICS.CNTL.CICSqualifier.DFHTEMP)-
          RECORDSIZE(4089,4089)           -
          RECORDS(200)                    -
          NONINDEXED                      -
          CONTROLINTERVALSIZE(4096)       -
          SHAREOPTIONS(2 3)               -
          VOLUMES(volid))                 -
        DATA(NAME(CICSTS42.CICS.CNTL.CICSqualifier.DFHTEMP.DATA) -
          UNIQUE)
/*
```

Figure 1. Sample job defining an auxiliary temporary storage data set

What to do next

Use the **TS** system initialization parameter to specify an appropriate number of VSAM buffers and strings for auxiliary temporary storage. CICS uses each VSAM buffer to make a control interval from DFHTEMP available in CICS storage, and uses a VSAM string for each VSAM I/O request between a buffer and DFHTEMP. Typically, the default setting of three buffers and three strings is sufficient. For information about the performance considerations, see Auxiliary temporary storage: monitoring and tuning in the *CICS Performance Guide*.

Control interval size for auxiliary temporary storage

You specify the control interval size for the auxiliary temporary storage data set with the **CONTROLINTERVALSIZE** parameter in the VSAM CLUSTER definition. Because a control interval contains one or more temporary storage records, take the temporary storage record size into account when choosing the control interval size.

A temporary storage record is a single numbered item in a temporary storage queue, which might be written by CICS or an application. A temporary storage record must have the following space:
- 36-bytes for the temporary storage header.
- The length of the data in the temporary storage record (the item in the temporary storage queue). If you are using BMS with 3270 support, the data length of the record is at least as large as the 3270 buffer size. For 3270 terminals

with the alternate screen size facility, the data length is the larger of the two sizes. Make sure that you allow sufficient space for the data length used by large-screen devices.

The total number of bytes allocated for a temporary storage record (including the 36-byte header) must be rounded up to a multiple of 64 for control interval sizes less than, or equal to, 16 KB (16 384-bytes), or a multiple of 128 for larger control interval sizes.

CICS can process temporary storage records that exceed the control interval size, but performance might degrade in this situation. Choose a control interval size large enough to hold at least one instance of the largest normally occurring temporary storage record, together with the VSAM control information for the control interval.

Typically, a control interval contains more than one temporary storage record, and the records might be of different sizes. The control interval size affects transfer efficiency: a smaller size can improve performance if access to temporary storage is random, and a larger size can improve performance if applications tend to use items in temporary storage in a sequential way. In general, the larger the queues and write to read ratio, the more sequential the usage tends to be.

Select your exact control interval size following these rules:
- The maximum control interval size is 32 KB.
- A control interval size less than, or equal to, 16 KB (16 384-bytes) must include space for 64-bytes of VSAM control information in addition to the space allowed for temporary storage records.
- A control interval size greater than 16 KB (16 384-bytes) must include space for 128-bytes of VSAM control information in addition to the space allowed for temporary storage records.
- A control interval size smaller than 8 KB must be a multiple of 512-bytes.
- A control interval size equal to or larger than 8 KB must be a multiple of 2 KB.

Example

If you use BMS to write a 24 x 80 character screen to temporary storage, the data written occupies 1920-bytes. You require 36-bytes for the CICS temporary storage header, giving a total of 1956-bytes. Rounding this up to a multiple of 64 gives 1984-bytes. Finally, adding a further 64-bytes of VSAM control information gives a control interval size of 2048-bytes to hold a single record. You can select a control interval size larger than 2048-bytes to hold several records that might differ in size.

Number of control intervals for auxiliary temporary storage

VSAM uses the RECORDS and RECORDSIZE operands to allocate enough space for the data set to hold the number of records of the specified size.

You must code the same value for the two operands of the RECORDSIZE parameter (the average and maximum record sizes), and this value must be 7 bytes less than the CONTROLINTERVALSIZE. In this way, the specified number of VSAM records matches the number of control intervals available to temporary storage management. You thus specify, indirectly, the number of control intervals in the temporary storage data set. (Note that the RECORDS and RECORDSIZE parameters do not correspond to the temporary storage records as seen at the CICS temporary storage interface.)

The number of control intervals to be allocated depends on user and system requirements for temporary storage, up to the maximum number permitted of 65 535.

Chapter 3. Setting up data sets for transient data

Data sets that are used for transient data queues can be intrapartition or extrapartition. The transient data intrapartition data set is a VSAM entry-sequenced data set (ESDS) that is used for queuing messages and data within the CICS region. Transient data extrapartition data sets are sequential files, normally on disk or tape; you can use the queue to send and receive data outside the CICS region.

About this task

Messages or other data are addressed to a symbolic queue that you define as either intrapartition or extrapartition using the CEDA transaction. The queues can be used as indirect destinations to route messages or data to other queues. System messages that CICS produces are commonly sent to transient data queues, either intrapartition or extrapartition.

Procedure

1. Define all of the queues that CICS uses in your CICS region. Although the omission of any of the queues does not cause a CICS failure, you lose important information about your CICS region if CICS cannot write its data to the required queue.
   a. Use the sample definitions in group DFHDCTG to define the required queues. See TDQUEUE resources in the Resource Definition Guide for a summary.
   b. Take a backup copy of the changes that you made to DFHDCTG. When maintenance is applied, the DFHDCTG group might be refreshed, overwriting your changes. Taking a backup avoids this problem.
2. Define the intrapartition data set using job control statements. See “Defining the intrapartition data set” for details on how to do this step.
3. Define the extrapartition data sets using job control statements. See “Defining extrapartition data sets” on page 20 for details on how to do this step.
4. To print CICS system messages on a local printer as they occur, use the transient data write-to-terminal sample program, DFH$TDWT. This sample program is supplied with the CICS in CICSTS42.CICS.SDFHLOAD and the assembler source is in CICSTS42.CICS.SDFHSAMP.

Related information:

Transient data control in CICS Application Programming

Defining the intrapartition data set

You can either use the sample job described here to define the transient data intrapartition data set, or you can use the CICS-supplied job, DFHDEFDS. DFHDEFDS creates the DFHINTRA data set as one of the data sets for a CICS region

About this task

The intrapartition data set must be big enough to hold all the data for intrapartition queues. If you are using the sample job to define the transient data intrapartition data set, perform the following steps:

Procedure

1. Decide if a single extent data set on a single volume is appropriate. If you define one extent on one volume, you might require a much larger data set than your average requirements to cater for exceptional cases. You can define multiple extents or multiple volumes or both for the data set. For details, see "Using multiple extents and multiple volumes" on page 19.
2. Specify a **CONTROLINTERVALSIZE** parameter that is large enough to hold the longest data record, in addition to the 32 bytes that CICS requires for its own purposes. The maximum control interval size is 32 KB. Space is allocated to queues in units of a control interval (CI). The first CI is reserved for CICS use; the remaining CIs are available to hold data. Data records are stored in CIs according to VSAM standards.
3. If you allocate space in records, rather than tracks or cylinders, you must specify a RECORDSIZE value. The value must be 7 bytes less than the **CONTROLINTERVALSIZE**.
4. Add the data definition statement for the intrapartition data set to the CICS startup job stream. The DD name for the intrapartition data set is DFHINTRA, and the DSN operand must be the name of the VSAM entry-sequenced data set. For example, you could specify:

   ```
   //DFHINTRA  DD  DSNAME=CICSTS42.CICS.applid.DFHINTRA,DISP={OLD|SHR}
   ```

Example

```
//DEFDS     JOB  accounting info,name,MSGCLASS=A
//TDINTRA   EXEC PGM=IDCAMS
//SYSPRINT  DD   SYSOUT=A
//SYSIN     DD   *
       DEFINE CLUSTER -
              ( NAME(CICSTS42.CICS.applid.DFHINTRA)    -
                RECORDSIZE(1529,1529)          -
                RECORDS(100)                   -
                NONINDEXED                     -
                CONTROLINTERVALSIZE(1536)      -
                VOL(volid))                    -
            DATA  -
              ( NAME(CICSTS42.CICS.applid.DATA.DFHINTRA))
/*
//
```

Figure 2. Sample job to define a transient data intrapartition data set

What to do next

Use the **TD** system initialization parameter to specify an appropriate number of VSAM buffers and strings for the transient data intrapartition data set. CICS uses buffers to make control intervals from the data set available in CICS storage, and uses strings for VSAM I/O requests between a buffer and the data set. Typically, the default setting of three buffers and three strings is sufficient.

What happens if the intrapartition data set fails to open

The DFHINTRA data set is opened during CICS initialization, regardless of the presence or absence of any intrapartition queue definitions that might become active during GRPLIST installation.

If DFHINTRA fails to open during an initial or cold start of CICS, a message is issued informing you of this, and asks if you want to continue or if you want to cancel CICS.

If DFHINTRA opened successfully during a previous startup but fails to open during a subsequent warm or emergency restart, CICS is terminated.

If CICS initializes without a DFHINTRA data set, any attempts to install intrapartition data destinations for that run of CICS fails and appropriate error messages are issued.

Using multiple extents and multiple volumes

Instead of defining one data set, which might have to be much larger than your average needs to cater for exceptional cases, you can define multiple extents and multiple volumes.

The job control statements in Figure 2 on page 18 are for a single extent data set defined on a single volume. That data set must be big enough to hold all your data. For more information about defining these, see “Defining data sets with multiple extents and volumes” on page 6.

Size of the intrapartition data set

If all available control intervals are currently allocated to queues, further EXEC CICS WRITEQ TD requests receive a NOSPACE response until control intervals are released by READQ TD or DELETEQ TD requests.

The intrapartition data set should hold at least two control intervals. When a logically recoverable queue is read until a QZERO condition is returned, and the request is committed, CICS retains the last CI used by the queue (unless there is no further space between the end of the last record and the end of the CI). Retaining the final CI used by the queue, means that subsequent requests to write to the queue can be accommodated in the remaining space within the CI if they can fit there. This avoids the need to acquire a new CI whenever the first request is made to write to the queue following a QZERO condition, which benefits performance on subsequent write requests. However, the CI is left allocated to the queue, and so increases the usage of the data set, and the possibility of a NOSPACE condition being returned by CICS.

Intrapartition data set restrictions

An intrapartition data set used as a transient data queue must be associated with only one CICS region.

CICS stores the relative byte addresses (RBAs) of records written to an intrapartition data set used as a transient data queue, and care must be taken to preserve the RBAs during any VSAM export or import operation on the data set.

Data can be corrupted or lost if:

- You start CICS with the wrong intrapartition data set; that is, a data set that contains data from another CICS region.
- You use VSAM export or import services to:
  - Increase the available space by compressing the data set, or
  - Increase the control interval size

Defining extrapartition data sets

You can define each extrapartition data set either for input only or for output only, but not for both.

About this task

You should define transient data extrapartition data sets used as queues for CICS messages with a record length of 132 bytes and a record format of V or VB. If you use the `FREE=CLOSE` parameter for an input extrapartition entry, be aware that it will only be usable once in the CICS session. Any attempt to read the queue after it has been CLOSEd and OPENed again will result in the IOERR condition being raised.

Example

```
//LOGUSR  DD   DSN=CICSTS42.CICS.applid.LOGUSR,DISP=(NEW,KEEP),
//        DCB=(DSORG=PS,RECFM=V,BLKSIZE=136),
//        VOL=SER=volid,UNIT=3380,SPACE=(CYL,2)
//MSGUSR  DD   SYSOUT=A
```

Figure 3. Sample JCL to define transient data extrapartition data sets

The DFHCXRF data set

Besides any extrapartition data sets that you might define, there is a special extrapartition queue that CICS creates dynamically. This queue has the identifier CXRF and is created by CICS early in the initialization process.

The DD name for this extrapartition data set is DFHCXRF. You cannot define CXRF or DFHCXRF. If you code DFHCXRF as a DSCNAME, or code CXRF as a destination identifier, an error message is issued. If you create a definition for CXRF in the CSD, CICS does not install the definition. This is because the CICS entry is hardcoded and cannot be removed or replaced.

If an attempt is made to write to a CICS-defined transient data queue before CICS is fully initialized, a message is written to CXRF.

If, on an initial or cold start, a request is received to write a record to a queue that has not yet been installed as part of GRPLIST, the record is written to CXRF.

If an attempt is made to write to an intrapartition queue after the warm keypoint has been taken, the record is written to CXRF.

Active CICS regions

CICS uses the CXRF queue during CICS initialization as some CICS components might need to write to transient data queues.

If the queues are not available at initialization time, the request to write to these queues is redirected to CXRF. Any requests from CICS components to write to transient data before the CXRF queue definition has been installed fails with a QIDERR condition.

Any requests to write to an intrapartition transient data queue after the warm keypoint has been taken during a normal shutdown are routed to CXRF.

If you want to take advantage of the special CXRF queue, you must include a DD statement for DFHCXRF. If you omit the DD statement, transient data write requests redirected to CXRF fail with a NOTOPEN condition.

DFHCXRF DD statements

You can define the DFHCXRF data set to MVS in the same way as other transient data extrapartition data sets, either to a SYSOUT data set or a sequential data set on disk (or tape). For example, you could use either of the DD statements shown in the following example in a startup job stream for a CICS region:

```
//DFHCXRF  DD SYSOUT=*
```

or

```
//DFHCXRF  DD DSN=CICSTS42.CICS.applid.DFHCXRF,DISP=(NEW,KEEP),
//                        DCB=(DSORG=PS,RECFM=V,BLKSIZE=136),
//                        VOL=SER=volid,UNIT=3380,SPACE=(TRK,5)
```

Figure 4. Sample DD statements for DFHCXRF

Chapter 4. Setting up CICS log streams

Create CICS log streams to use the MVS system logger to record journaling and logging information.

About this task

CICS log manager supports:

- The CICS system log, which is also used for dynamic transaction backout.
- User journals, forward recovery logs, and auto-journals. These are general logs.

This chapter covers the following topics:

Defining CICS system logs

Each CICS region requires its own system log. The system log is implemented as two MVS system logger log streams - a primary and a secondary - but, together, they form a single logical log stream.

About this task

The system log is used for recovery purposes - for example, during dynamic transaction backout, or during emergency restart, and is not meant to be used for any other purpose.

CICS connects to its system log automatically during initialization (unless you specify a journal model definition that defines the system log as type DUMMY).

You must define a system log if you want to preserve data integrity in the event of unit of work failures and CICS failures. CICS needs a system log in order to perform:

- The backout of recoverable resources changed by failed units of work.
- Cold starts when CICS needs to recover conversation state data with remote partners.
- Warm restarts, when CICS needs to restore the region to its pre-shutdown state.
- Emergency restarts, when CICS needs to restore the region to its pre-shutdown state as well as recovering transactions to perform the backout of recoverable resources changed by units of work that were in-flight at the time of shutdown.

For information on how to define CICS system log streams, see Coupling facility log streamscoupling facility log streams and DASD-only log streamsDASD-only log streams in the *CICS Transaction Server for z/OS Installation Guide*.

Planning your CICS system log streams

A CICS system log (which comprises two physical log streams) is unique to the region and must not be used by any other CICS region. The default log stream names *region_userid.applid*.DFHLOG and *region_userid.applid*.DFHSHUNT are designed to ensure unique names.

Using JOURNALMODELs to define the system log

You might want to use journal models for system logs if the CICS region userid changes between runs (for example, where a test CICS region is shared between application developers).

It would be wasteful to create log streams with a different high level qualifier for each user. Using the same system log stream regardless of the which programmer starts up the CICS region keeps the number of log streams to a minimum. The following example uses a specific JOURNALNAME, with symbols in the STREAMNAME, making this an explicit model for the primary log stream.

```
DEFINE GROUP(TEST) DESC('System logs for test CICS regions')
       JOURNALMODEL(DFHLOG) JOURNALNAME(DFHLOG) TYPE(MVS)
       STREAMNAME(TESTCICS.&APPLID..&JNAME.)
```

If you define JOURNALMODEL resource definitions to define log stream names for DFHLOG and DFHSHUNT, ensure that the resulting log stream names are unique. If you have some CICS regions that use the same applid, you must use some other qualifier in the log stream name to ensure uniqueness.

If you use JOURNALMODEL resource definitions for the system log, these resource definitions must be defined and added to the appropriate group list (using the CSD utility program, DFHCSDUP) before INITIAL-starting CICS.

System logs cannot be TYPE(SMF).

DFHLOG can be TYPE(DUMMY), but you can use this only if you always INITIAL start your CICS regions and there are no recoverable resources requiring transaction backout. CICS cannot perform a cold start, or warm or emergency restart if TYPE(DUMMY) is specified on the JOURNALMODEL definition.

If you do not want to use a system log, perhaps in a test or development region, define a JOURNALMODEL for DFHLOG with type DUMMY, as shown in the following example:

```
DEFINE  JOURNALMODEL(DFHLOG)   GROUP(CICSLOGS)
        JOURNALNAME(DFHLOG)
        TYPE(DUMMY)
```

To start a CICS region without a system log, you must ensure that a JOURNALMODEL definition, such as the one shown above, is included in the start-up group list. Use the DFHCSDUP batch utility program to define the required JOURNALMODEL and to add the group to the group list.

DFHSHUNT can be TYPE(DUMMY). This is not recommended, however, because it impairs the ability of CICS to manage the system log.

Effects of the AKPFREQ parameter

Review the activity keypoint frequency (AKPFREQ) defined for each CICS region. The larger the value, the more coupling facility space you need for the system logs, but you should not set AKPFREQ too low so that transactions last longer than an activity keypoint interval.

Defining CICS general logs

Journals on general log streams comprise user journals, forward recovery logs, and autojournals.

About this task

Planning log streams for use by your user journals and autojournals

General logs are identified as such by their MVS log stream names, which are differentiated from system log streams in that their names do not end with DFHLOG or DFHSHUNT.

Using JOURNALMODELs to define general logs

If you are running multiple cloned copies of your application-owning regions (AORs), it is probable that the logged data is common and that you would want to merge the data from all of the AORs to the same log stream.

The following JOURNALMODEL resource definition maps CICS journals of the same journal identifier to a shared log stream:

```
DEFINE GROUP(MERGE) DESC('Merge journals across cloned CICS regions')
       JOURNALMODEL(JRNLS) JOURNALNAME(DFHJ*) TYPE(MVS)
       STREAMNAME(&USERID..SHARED.&JNAME.)
```

In this example, the literal SHARED is used in place of the default CICS applid, which would require a unique log stream for each region.

You might want to use JOURNALMODELs to map journals to log streams if the CICS region userid changes between runs. This could be the case, for example, where CICS test regions are shared between groups of developers. It would be wasteful to create log streams with a different high level qualifier for each user and you might prefer to use the same log streams regardless of which developer starts up a CICS region. For example, the following generic JOURNALMODEL definition maps all journals not defined by more explicit definitions to the same log stream

```
DEFINE GROUP (TEST) DESC('Journals for test CICS regions')
       JOURNALMODEL(JRNLS) JOURNALNAME(*) TYPE(MVS)
       STREAMNAME(TESTCICS.&APPLID..&JNAME.)
```

You might want to merge data written by CICS regions using different journal names to a single log stream.

```
DEFINE GROUP (TEST) DESC('Merging journals 10 to 19')
       JOURNALMODEL(J10TO19) JOURNALNAME(DFHJ1*) TYPE(MVS)
       STREAMNAME(&USERID..MERGED.JNLS)
DEFINE GROUP (TEST) DESC('Merging journalnames JNLxxxxx')
       JOURNALMODEL(JNLXXXXX) JOURNALNAME(JNL*) TYPE(MVS)
       STREAMNAME(&USERID..MERGED.JNLS)
```

The last qualifier of the stream name is used as the CICS resource name for dispatcher waits. Therefore, if it is self-explanatory, it can be helpful when interpreting monitoring information and CICS trace entries.

Planning log streams for use by your forward recovery logs

CICS performs the logging for RLS and non-RLS data sets.

You can share a forward recovery log stream between multiple data sets - you do not need to define a log stream for each forward-recoverable data set. Your decision is a balance of transaction performance, rapid recovery, and the work involved in managing a large number of log streams.

For a data set open in RLS mode, the MVS logger merges all the forward recovery log records from the various CICS systems on to the shared forward recovery log.

Some points to consider are:

- All data sets used by one transaction should use the same log stream (to reduce the number of log streams written to at syncpoint).
- A good starting point is to use the same forward recovery log ID that you use in an earlier CICS release.
- Share a forward recovery log stream between data sets that:
  - Have similar security requirements
  - Have similar backup frequency
  - Are likely to need restoring in their entirety at the same time
- Log stream names should relate to the data sets. For example, PAYROLL.data_sets could be mapped to a forward recovery log named PAYROLL.FWDRECOV.PAYLOG.
- The last qualifier of the stream name is used as the CICS resource name for dispatcher waits. Therefore, if it is self-explanatory, it can be helpful when interpreting monitoring information and CICS trace entries.
- Don't mix high update frequency data sets with low update frequency data sets, because this causes a disproportionate amount of unwanted log data to be read during recovery of low frequency data sets.
- Don't put all high update frequency data sets on a single log stream because you could exceed the throughput capacity of the stream.
- If you define too many data sets to a single log stream, you could experience frequent structure-full events when the log stream can't keep up with data flow.
- Redundant data should be deleted from log streams periodically. On OS/390® Release 2 or earlier, this is a user responsibility, and must be done before the system logger inventory entry exceeds the limit of 168 data sets per log stream. On OS/390 Release 3 or later, you can specify that redundant data is to be deleted automatically from general log streams, by defining them with AUTODELETE(YES) RETPD(dddd). For information about the AUTODELETE and RETPD MVS parameters, see the *CICS Transaction Server for z/OS Installation Guide*.

  Typically, for a forward recovery log, deletion of old data is related to the data backup frequency. For example, you might keep the 4 most recent generations of backup, and when you delete a redundant backup generation you should also delete the corresponding redundant forward recovery log records. These are the records older than the redundant backup because they are no longer needed for forward recovery.

  For information about IBM CICS VSAM Recovery, see the *CICS VSAM Recovery User's Guide*.

Planning log streams for use by your log of logs (DFHLGLOG)

The log of logs is written by CICS to provide information to forward recovery programs such as CICS VSAM Recovery.

The log of logs is a form of user journal containing copies of the tie-up records written to forward recovery logs. Thus it provides a summary of which recoverable VSAM data sets CICS has used, when they were used, and to which log stream the forward recovery log records were written.

If you have a forward recovery product that can utilize the log of logs, you should ensure that all CICS regions sharing the recoverable data sets write to the same log of logs log stream.

```
DEFINE GROUP(JRNL) DESC('Merge log of logs')
       JOURNALMODEL(DFHLGLOG) JOURNALNAME(DFHLGLOG) TYPE(MVS)
       STREAMNAME(&USERID..CICSVR.DFHLGLOG)
```

Note: Note that this definition is supplied in group DFHLGMOD in DFHLIST.

If you don't have a forward recovery product that can utilize the log of logs you can use a dummy log stream:

```
DEFINE GROUP(JRNL) DESC('Dummy log of logs')
       JOURNALMODEL(DFHLGLOG) JOURNALNAME(DFHLGLOG) TYPE(DUMMY)
```

Do not share the log of logs between test and production CICS regions, because it could be misused to compromise the contents of production data sets during a restore.

Naming journals

The journals have the following naming conventions.

About this task

System logs

DFHLOG and DFHSHUNT are the journal names for the CICS system log.

CICS automatically creates journal table entries for DFHLOG and DFHSHUNT during initialization as shown in Table 1.

Table 1. Journal name entry for the CICS primary system log

Journal table entry - CICS system log	**Created during system initialization**
Name: DFHLOG	Always DFHLOG for the primary log
Status: Enabled	Set when journal entry created
Type: MVS	The default, but it can be defined as DUMMY on JOURNALMODEL definition (DUMMY = no output)
LSN: log_stream_name	By default, log_stream_name resolves to &reguserid..&applid..DFHLOG, but this can be user-defined on a JOURNALMODEL definition

Forward recovery logs

For non-RLS data sets that have not specified their recovery attributes in the VSAM catalog, forward recovery log names are of the form DFHJ*nn* where *nn* is a number in the range 1–99.

You define the name of the forward recovery log in the forward recovery log id (FWDRECOVLOG) in the FILE resource definition.

User applications can use a forward recovery log through a user journal name that maps on to the same log stream name. In this case, the user records are merged on to the forward recovery log. See Table 2 on page 28 for an example of this.

Table 2. Example of journal name entry for non-RLS mode forward recovery log

Journal table entry - forward recovery log	**Entry created during file-open processing**
Name: DFHJ01	Name derived from FWDRECOVLOG identifier. For example, FWDRECOVLOG(01) = DFHJ01, thus FWDRECOVLOG(nn) = DFHJnn
Status: Enabled	Set when journal entry created
Type: MVS	The default, but it can be defined as DUMMY on JOURNALMODEL definition (DUMMY = no output)
LSN: log_stream_name	By default, log_stream_name resolves to &reguserid..&applid..DFHJ01, but this can be user-defined on a JOURNALMODEL definition

Note: There is no journal table entry for the forward recovery log of an RLS file. The recovery attributes and LSN are obtained directly from the VSAM catalog, and the LSN is referenced directly by CICS file control. Therefore there is no need for indirect mapping through a journal name.

You can also choose to specify the recovery attributes and LSN for a non-RLS file in the VSAM catalog.

User journals

CICS user journals are identified by their journal names (or number, in the case of DFHJ*nn* names), which map on to MVS log streams.

You name your user journals using any 1-8 characters that conform to the rules of a data set qualifier name. Apart from the user journal names that begin with the letters DFHJ, followed by two numeric characters, you should avoid using names that begin with DFH. User journal names of the form DFHJ*nn* are supported for compatibility with earlier CICS releases.

Although 8-character journal names offer considerable flexibility compared with the DFHJnn name format of previous releases, you are recommended not to create large numbers of journals (for example, by using the terminal name or userid as part of a program-generated name).

Journal name DFHLOG (on an EXEC CICS WRITE JOURNALNAME command) indicates that you want to write to the CICS system log.

When used in FILE and PROFILE resource definitions, the journal numbers 1 through 99 map on to the user journal names DFHJ01–99. You can map these journal names to specific MVS log stream names by specifying JOURNALMODEL resource definitions, or allow them to default. If you do not specify matching JOURNALMODEL definitions, by default user journals are mapped to LSNs of the form *userid.applid*.DFHJ*nn*.

Table 3 shows an example of a user journal name table entry.

Table 3. Example of a user journal name entry for output to MVS

Journal table entry - user journals	**Entry created on first reference**
Name: JRNL001	Name derived from API WRITE JOURNALNAME command

Table 3. Example of a user journal name entry for output to MVS (continued)

Journal table entry - user journals	**Entry created on first reference**
Status: Enabled	Set when journal entry created
Type: MVS	This journal is defined for MVS output by a JOURNALMODEL that references the JRNL001 name
LSN: log_stream_name	By default, log_stream_name resolves to &reguserid..&applid..JRNL001, but this can be user-defined on a JOURNALMODEL definition

Installing system log and journal names

The journal control table of earlier releases is obsolete, and is replaced by a journal names table that CICS creates dynamically.

The CICS log manager needs the name of the log stream that corresponds to a CICS system log or general log, and the type - whether it is MVS, SMF, or a dummy. Except for VSAM forward recovery log stream names taken directly from the ICF catalog, CICS maintains this information in the journal names table, together with the corresponding log stream token that is returned by the MVS system logger when CICS successfully connects to the log stream.

Defining JOURNALMODELs

CICS uses JOURNALMODEL definitions to resolve log stream names at the following times:

About this task

`System log`
During initialization, on an initial start only.

On a cold, warm or emergency restart, CICS retrieves the log stream name from the CICS global catalog.

`General logs`
When a journal name is first referenced after the start of CICS, or when it is first referenced again after its log stream has been disconnected. Log stream disconnection, requiring further reference to a matching JOURNALMODEL resource definition, occurs as follows:

`User journals`
As soon as you issue a DISCARD JOURNALNAME command.

Any further references to the discarded journal name means that CICS must again resolve the log stream name by looking for a matching JOURNALMODEL resource definition. You can change the log stream name for a user journal by installing a modified JOURNALMODEL definition.

`Auto journals for files`
All files that are using the log stream for autojournaling are closed.

`Forward recovery logs`
All files that are using the log stream for forward recovery logging are closed.

A JOURNALMODEL definition generally specifies a generic journal name, thereby mapping to the same MVS log stream any journal names that match on the generic name. JOURNALMODEL definitions can also be specific models and, using JOURNALMODEL definitions, you can map many journals or forward recovery logs to the same MVS log stream, or assign them to SMF (see Figure 5).

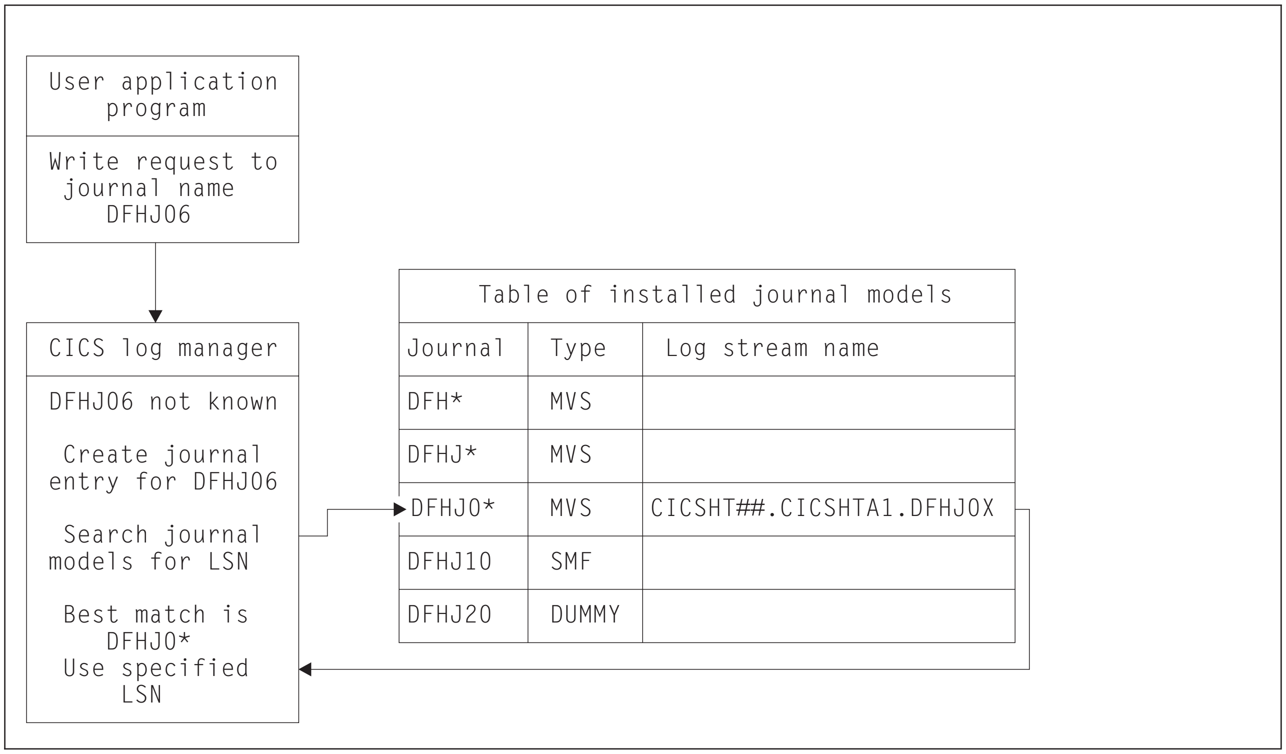

User application program
Write request to journal name DFHJ06
CICS log manager
DFHJ06 not known
Create journal entry for DFHJ06
Search journal models for LSN
Best match is DFHJ0*
Use specified LSN

Table of installed journal models

Journal	Type	Log stream name
DFH*	MVS	
DFHJ*	MVS	
DFHJ0*	MVS	CICSHT##.CICSHTA1.DFHJ0X
DFHJ10	SMF	
DFHJ20	DUMMY	

Figure 5. Looking for a journal model that matches a journal name. CICS searches the Table of installed journal models to find the log stream name that corresponds to the journal name, using a “best-match” algorithm.

Mapping log streams

Except for VSAM RLS forward recovery log stream names, which are obtained directly from the VSAM catalog, CICS maps the system log name or journal name to a corresponding log stream name.

About this task

CICS does this either by using a user-defined JOURNALMODEL resource definition (if one exists), or by using default names created by resolving symbolic names.

Mapping of the system log stream

On a cold start, or warm or emergency restart, CICS retrieves the system log stream name from the CICS global catalog.

CICS uses the default log stream names unless you provide a JOURNALMODEL resource definition for the system log.

If there are JOURNALMODEL definitions for your system logs (CICS finds JOURNALMODEL definitions with JOURNALNAME(DFHLOG) and

JOURNALNAME(DFHSHUNT)), it attempts to connect to the system log streams named in these definitions. System log stream names must be unique to the CICS region.

If you define JOURNALMODEL resource definitions for your system logs, ensure that:

- The log streams named in the definition are defined to the MVS system logger, or
- Suitable model log streams are defined so that they can be created dynamically.

If there are no suitable JOURNALMODEL definitions, CICS attempts to connect to system log streams, using the following default names:

- userid.applid.DFHLOG
- userid.applid.DFHSHUNT

where 'userid' is the RACF userid under which the CICS address space is running, and 'applid' is the region's z/OS Communications Server APPL name. The CSD group DFHLGMOD holds the CICS-supplied JOURNALMODEL definitions for the default DFHLOG and DFHSHUNT log streams.

Before you try to use these default log stream names, ensure that

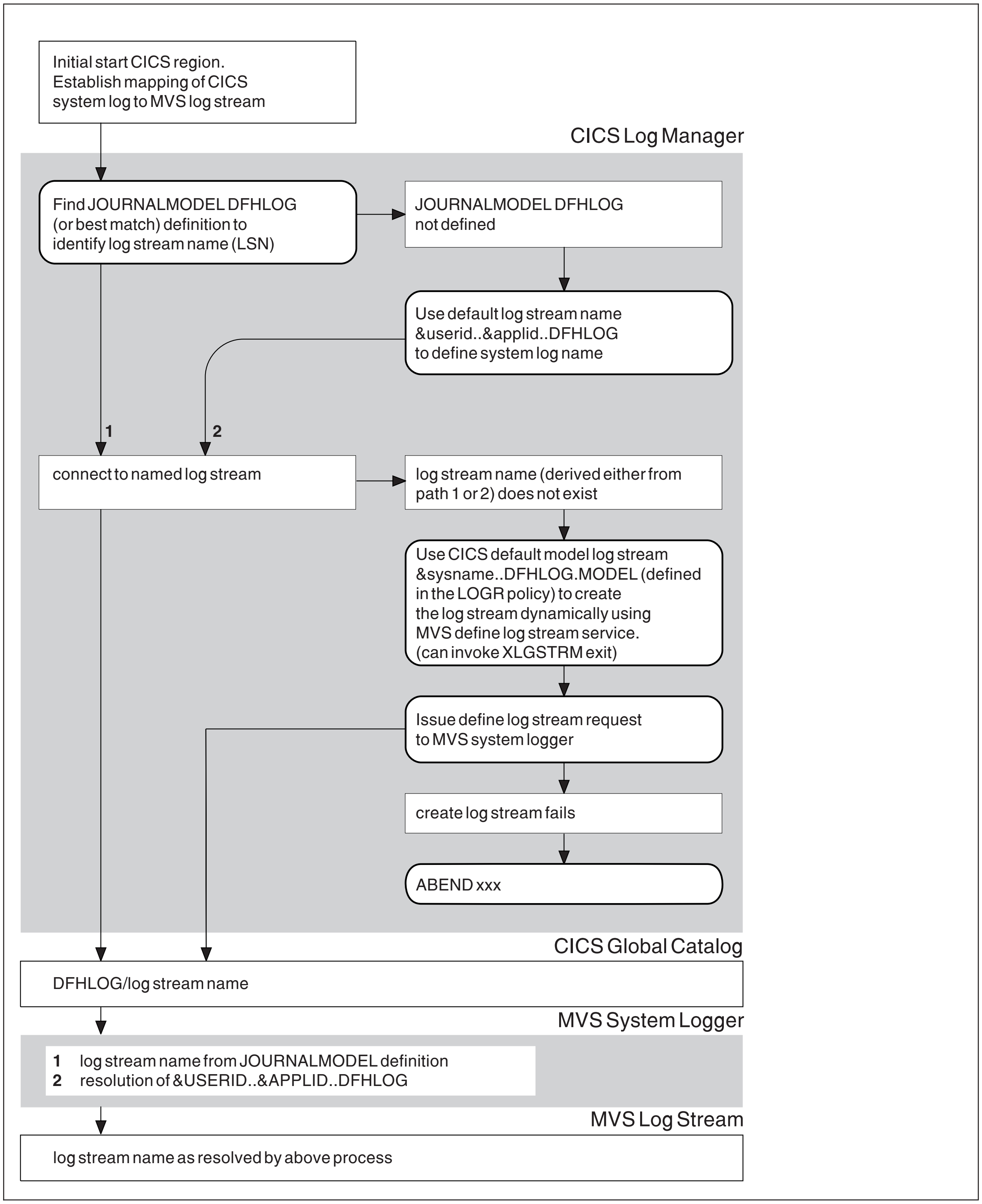
- The default log streams are defined explicitly to the MVS system logger, or
- Suitable model log streams are defined so that they can be created dynamically.

If these log streams are not available (perhaps they have not been defined to MVS) or the definitions are not found (perhaps they have not been installed), CICS attempts to create system log streams using a model log stream named &*sysname.LSN_last_qualifier*.MODEL, where:

- &*sysname* is the MVS symbol that resolves to the system name of the MVS image
- *LSN_last_qualifier* is the last qualifier of the log stream name as specified on the JOURNALMODEL resource definition.

If you do not provide a JOURNALMODEL resource definition for DFHLOG and DFHSHUNT, or if you use the CICS definitions supplied in group DFHLGMOD, the model names default to &*sysname*.DFHLOG.MODEL and &*sysname*.DFHSHUNT.MODEL. Once these log streams have been created, CICS then connects to them.

Figure 6 on page 32 shows a graphical representation of the system log mapping process during an INITIAL start.



Initial start CICS region. Establish mapping of CICS system log to MVS log stream
CICS Log Manager
Find JOURNALMODEL DFHLOG (or best match) definition to identify log stream name (LSN)
JOURNALMODEL DFHLOG not defined
Use default log stream name &userid..&applid..DFHLOG to define system log name
1
2
connect to named log stream
log stream name (derived either from path 1 or 2) does not exist
Use CICS default model log stream &sysname..DFHLOG.MODEL (defined in the LOGR policy) to create the log stream dynamically using MVS define log stream service. (can invoke XLGSTRM exit)
Issue define log stream request to MVS system logger
create log stream fails
ABEND xxx
CICS Global Catalog
DFHLOG/log stream name
MVS System Logger
1 log stream name from JOURNALMODEL definition
2 resolution of &USERID..&APPLID..DFHLOG
MVS Log Stream
log stream name as resolved by above process

Figure 6. How CICS maps the system log (DFHLOG) to a log stream name (LSN) during an INITIAL start. CICS uses the same process for the secondary system log, DFHSHUNT.

Mapping of general log streams

CICS uses the default log stream names unless you provide a JOURNALMODEL resource definition for the journal or log.

If there is a JOURNALMODEL definition for the log, CICS attempts to connect to the log stream named in the definition.

If you define JOURNALMODEL resource definitions for your system logs, ensure that:

- The log streams named in the definition are defined to the MVS system logger, or
- Suitable model log streams are defined so that they can be created dynamically.

If CICS cannot connect to the log stream named in the JOURNALMODEL definition, it attempts to connect to a log stream, using the default name:

```
userid.applid.journalname
```

Before you try to use this default log stream name, ensure that

- The default log stream is defined explicitly to the MVS system logger, or
- A suitable model log stream is defined so that it can be created dynamically.

If the log stream is not available (perhaps it has not been defined to MVS) or the definition is not found (perhaps it has not been installed), CICS attempts to create a log stream using the default name:

```
LSN_QUALIFIER1.LSN_QUALIFIER2.MODEL
```

where the qualifier fields are based on the JOURNALMODEL definition streamname attribute, as follows:

- If the log stream being created has a qualified name consisting of only two names (*qualifier1*.*qualifier2*) or has an unqualified name, CICS constructs the model name as *qualifier1*.MODEL or *name*.MODEL.
- If the log stream being created has a qualified name consisting of 3 or more names (*qualifier1*.*qualifier2*....*qualifier_n*), CICS constructs the model name as *qualifier1*.*qualifier2*.MODEL.

Once the log stream has been created, CICS connects to it.

Figure 7 on page 34 shows a graphical representation of the mapping process for general logs.

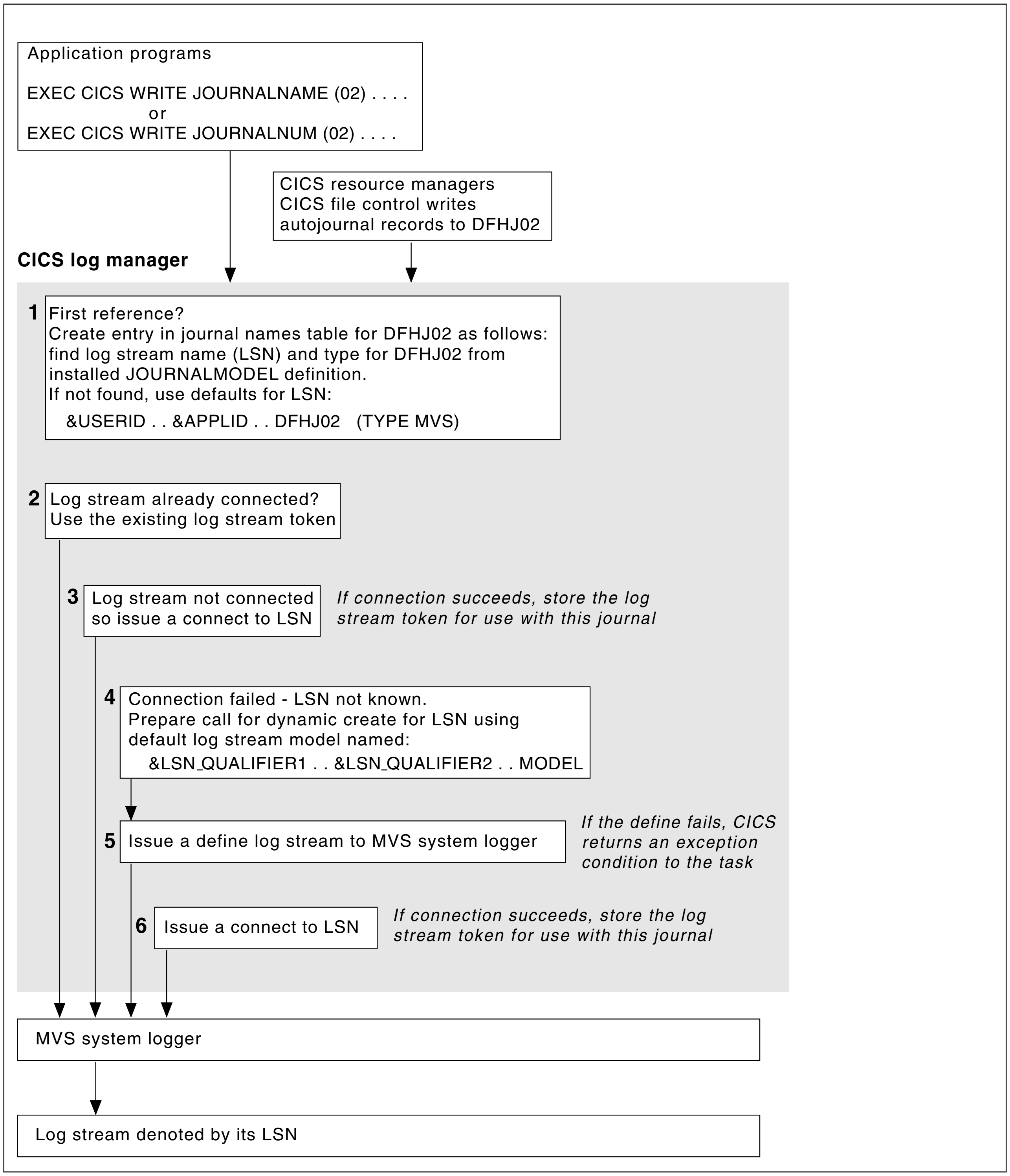

Application programs
EXEC CICS WRITE JOURNALNAME (02) . . . .
or
EXEC CICS WRITE JOURNALNUM (02) . . . .
CICS resource managers
CICS file control writes
autojournal records to DFHJ02
CICS log manager
1
First reference?
Create entry in journal names table for DFHJ02 as follows:
find log stream name (LSN) and type for DFHJ02 from
installed JOURNALMODEL definition.
If not found, use defaults for LSN:
&USERID . . &APPLID . . DFHJ02 (TYPE MVS)
2
Log stream already connected?
Use the existing log stream token
3
Log stream not connected
so issue a connect to LSN
If connection succeeds, store the log
stream token for use with this journal
4
Connection failed - LSN not known.
Prepare call for dynamic create for LSN using
default log stream model named:
&LSN_QUALIFIER1 . . &LSN_QUALIFIER2 . . MODEL
5
Issue a define log stream to MVS system logger
If the define fails, CICS
returns an exception
condition to the task
6
Issue a connect to LSN
If connection succeeds, store the log
stream token for use with this journal
MVS system logger
Log stream denoted by its LSN

Figure 7. How a CICS journal is mapped to its log stream name (LSN). The name is DFHJ02, used here for user journaling and file control autojournaling.

Using the Journal utility program, DFHJUP

CICS provides a journal utility program, DFHJUP.

About this task

You can use the DFHJUP utility program which uses the SUBSYS=(LOGR... facility to select, print, or copy data held on MVS system logger log streams. Alternatively, you can use your own utility to use the SUBSYS=(LOGR... facility.

For information about running DFHJUP, and the SUBSYS=(LOGR.. , facility, see the *CICS Operations and Utilities Guide*.

Chapter 5. Setting up the CICS system definition data set

This section describes how to define and initialize the system definition data set (CSD) that CICS needs to store definitions of the resources that it uses. It also describes using the CEDA transaction, particularly when a CSD is being shared by more than one CICS region.

About this task

You might have used the CEDA transaction already, when running the interactive installation verification procedures (IVPs) after installing CICS. If you ran any of the IVPs (for example, the jobs called DFHIVPBT or DFHIVPOL), you also used a CSD. Note that the CSD created by the IVPs is limited in size, and initialized with the CICS-supplied resource definitions only.

A CSD is required for most resource definitions. If you are creating a CSD for the first time, go through the steps listed in "Planning your CSD configuration." The remainder of this section describes these steps in more detail.

If you are already using a CSD with a previous release of CICS, upgrade your CSD to include CICS resource definitions new in CICS Transaction Server for z/OS, Version 4 Release 2. For information about upgrading your CSD, see the *CICS Resource Definition Guide*.

You can run the DFHCSDUP offline utility as a batch job to read from and write to the CSD. You should give UPDATE access to the CSD to **only** those users who are permitted to use the DFHCSDUP utility.

Planning your CSD configuration

Before you can create a CSD, you must plan your configuration.

Procedure

1. Decide how much disk space you require.
2. Decide whether you want to use the CSD in RLS or non-RLS mode. Having the CSD open in RLS mode allows more than one CICS region to update the CSD concurrently. However, if your CSD is defined as a recoverable data set, and you want update it using the batch utility, DFHCSDUP, you must quiesce the CSD in the CICS regions before running DFHCSDUP.

   If you decide to use RLS for the CSD, specify `CSDRLS=YES` as a system initialization parameter. See "VSAM record-level sharing (RLS)" on page 84.
3. Decide what backup and recovery procedures you require for your CSD. The CSD can use backup-while-open (BWO), which means that DFSMS components can back up the CSD while the data set is open for update. To use BWO, ensure that DFSMShsm and DFSMSdss components of DFSMS 1.2 or later are available. The CSD must have an ICF catalog entry and be defined in SMS-managed storage.
   - Define the recovery options for a CSD accessed in RLS mode:
     - Specify BWO(TYPECICS) in the ICF catalog to make the data set eligible for backup-while open.

    - Make the CSD a recoverable data set by specifying the appropriate LOG parameter in the ICF catalog.
  - Define the recovery options for a CSD accessed in non-RLS mode:
    - Make the data set eligible for backup-while-open by either specifying BWO(TYPECICS) in the catalog or setting the **CSDBKUP** system initialization parameter to DYNAMIC.
    - Make the data set recoverable by setting the appropriate LOG parameter in the ICF catalog entry or specifying the appropriate option on the **CSDRECOV** system initialization parameter.

      By default, the recovery options in the catalog override the attributes in the FILE resource. If no recovery options are set in the catalog, CICS uses the attribute values of the FILE resource. You can set the **NONRLSRECOV** system initialization parameter to FILEDEF, if you want CICS to always use the recovery options on the FILE resource instead of the catalog.
4. Define and initialize the CSD.
5. Decide what CICS file processing attributes you want for your CSD. Although the CSD is a CICS file-control-managed data set, you define file control resource definitions for the CSD by specifying CSDxxxxx system initialization parameters (see “Defining CSD attributes” on page 42).
6. Decide if you want to use command logs for RDO. See “Logging RDO commands” on page 55 for details of the CADL, CAIL, CRDI, CSDL, CSFL, CSKL, CSPL, and CSRL destinations that CICS uses for RDO command logs.
7. Make the CSD available to CICS, either by using dynamic allocation or by including the necessary DD statement in the CICS startup job stream. For dynamic allocation of the CSD, you name the fully qualified data set name, and the disposition, on the CSDDSN and the CSDDISP system initialization parameters respectively.

   When you have started CICS, test the RDO transactions CEDA, CEDB, and CEDC. For information about these transactions, see .

Calculating CSD disk space

Before you can create the CSD, you must calculate the amount of space you need in your CSD for definition records.

Procedure

1. In your calculation, allow for approximately 1800 CICS-supplied resource definitions of various types, which are loaded into the CSD when you initialize the CSD with the utility program, DFHCSDUP. You need to consider:
   a. Each resource definition (for example each program, transaction and terminal) needs one record. The sizes of these definition records are:

Resource	**Definition record size (maximum)**
ATOMSERVICE	720 bytes
BUNDLE	698 bytes
CONNECTION	260 bytes
CORBASERVER	1375 bytes
DB2CONN	308 bytes
DB2ENTRY	236 bytes
DB2TRAN	198 bytes
DJAR	445 bytes
DOCTEMPLATE	567 bytes
ENQMODEL	447 bytes

Resource	Definition record size (maximum)
FILE	369 bytes
IPCONN	468 bytes
JOURNALMODEL	222 bytes
JVMSERVER	208 bytes
LIBRARY	925 bytes
LSRPOOL	425 bytes
MAPSET	190 bytes
MQCONN	240 bytes
PARTITIONSET	190 bytes
PARTNER	408 bytes
PIPELINE	959 bytes
PROCESSTYPE	206 bytes
PROFILE	231 bytes
PROGRAM	499 bytes
REQUESTMODEL	1211 bytes
SESSION	296 bytes
TCPIPSERVICE	571 bytes
TDQUEUE	331 bytes
TERMINAL	327 bytes
TRANCLASS	192 bytes
TRANSACTION	545 bytes
TSMODEL	308 bytes
TYPETERM	402 bytes
URIMAP	1443 bytes
WEBSERVICE	708 bytes

b. Each group requires two 122-byte records
c. Each group list requires two 122-byte records
d. Each group name within a list requires one 68-byte record

2. Add a suitable contingency (approximately 25%) to the size that you have calculated so far.

What to do next

Use your final figure when you define the VSAM cluster for the CSD. (See the sample job in "Initializing the CSD.")

Initializing the CSD

The INITIALIZE command initializes your CSD with definitions of the CICS-supplied resources. After initialization, you can migrate resource definitions from your CICS control tables and begin defining your resources interactively with CEDA. You use INITIALIZE only once in the lifetime of the CSD.

Before you begin

Before you can use the CSD, you must define it as a VSAM KSDS data set, and initialize it using the DFHCSDUP utility program.

About this task

Use the sample job to define and initialize the CSD.

Procedure

1. Code the KEYS parameter as shown in the sample job. The key length is 22 bytes.
2. Calculate the CSD disk space that is required. The average record size is 200 bytes for a CSD that contains only the CICS-supplied resource definitions (generated by the INITIALIZE and UPGRADE commands). If you create a larger proportion of terminal resource definition entries than are defined in the initial CSD, the average record size is higher because of the larger size of the terminal-type entries. The TERMINAL and TYPETERM definition record sizes are listed under "Calculating CSD disk space" on page 38. The maximum record size is 2000, as shown in the sample job.
3. Code the SHAREOPTIONS parameter as shown in the sample job.
4. Optional: You can specify the recovery attributes for the CSD in the ICF catalog instead of using the CSD system initialization parameters. If you decide to use the CSD in RLS mode, you must define the recovery attributes in the ICF catalog. You specify the recovery attributes as:
   - `LOG(NONE)` (Nonrecoverable data set)
   - `LOG(UNDO)` (For backout only)
   - `LOG(ALL)` (For both backout and forward recovery)

   If you specify LOG(ALL), you must also specify LOGSTREAMID to define the 26-character name of the MVS log stream to be used as the forward recovery log. If you specify recovery attributes in the ICF catalog, and also want to use BWO, specify LOG(ALL) and BWO(TYPECICS).
5. You must specify the DDNAME for the CSD as DFHCSD.

Example

```
//DEFINIT  JOB  accounting information
//DEFCSD   EXEC PGM=IDCAMS
//SYSPRINT DD   SYSOUT=A
//AMSDUMP  DD   SYSOUT=A
//SYSIN    DD   *
   DEFINE CLUSTER -
           (NAME(CICSTS42.CICS.applid.DFHCSD) -
           VOLUMES(volid)             -
           KEYS(22 0)                 -                        1
           INDEXED                    -
           RECORDS(n1 n2)             -
           RECORDSIZE(200 2000)       -                        2
           FREESPACE(10 10)           -
           SHAREOPTIONS(2)            -                        3
           LOG(ALL)                   -                        4
           LOGSTREAMID(CICSTS42.CICS.CSD.FWDRECOV)   -         4
           BWO(NO)                                             4

          DATA                        -
           (NAME(CICSTS42.CICS.applid.DFHCSD.DATA)   -
           CONTROLINTERVALSIZE(8192))        -
          INDEX                              -
           (NAME(CICSTS42.CICS.applid.DFHCSD.INDEX))
/*
//INIT     EXEC PGM=DFHCSDUP,REGION=300K
//STEPLIB  DD DSN=CICSTS42.CICS.SDFHLOAD,DISP=SHR
//DFHCSD   DD DSN=CICSTS42.CICS.applid.DFHCSD,DISP=SHR            5
//SYSPRINT DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//SYSIN    DD *
          INITIALIZE
          LIST ALL OBJECTS
/*
//
```

Figure 8. Sample job to define and initialize the CSD

What to do next

The command **LIST ALL OBJECTS** lists the CICS-supplied resources that are now in the CSD.

Creating a larger CSD

To avoid the CSD filling while CICS is running, ensure that you define the data set with primary and secondary space parameters, and that there is sufficient DASD space available for secondary extents.

If your CSD fills up while you are running a CEDA transaction (or the offline utility), define a larger data set and use an AMS command, such as REPRO, to recover the contents of the CSD. If your CSD was dynamically allocated, you can close it, delete it, and redefine it as a larger data set. If your CSD was not dynamically allocated, you must shut down CICS to create a larger data set.

For a description of the commands that you can use for copying files, see the *MVS/ESA Integrated Catalog Administration: Access Method Services Reference* .

Defining CSD attributes

File processing attributes for the CSD are defined in a number of system initialization parameters.

About this task

Define suitable definitions for the following system initialization parameters:

Procedure

1. Define the type of access that is allowed using the **CSDACC** parameter.
2. Define whether the CSD is eligible for BWO using the **CSDBKUP** parameter. This parameter is ignored if you specify CSDRLS=YES. CICS uses the BWO parameter in the ICF catalog instead. By default, CICS also uses the BWO parameter in the ICF catalog for non-RLS mode CSDs if the LOG parameter in the ICF catalog specifies either UNDO or ALL. You can set the **NONRLSRECOV** system initialization parameter to FILEDEF if you want CICS to always use the **CSDBKUP** parameter over the BWO attribute.
3. Define the number of buffers for CSD data using the **CSDBUFND** parameter. This parameter is ignored if you specify CSDRLS=YES.
4. Define the number of buffers for the CSD index using the **CSDBUFNI** parameter. This parameter is ignored if you specify CSDRLS=YES.
5. Define the disposition of the CSD data set using the **CSDDISP** parameter.
6. Define the JCL data set name (DSNAME) of the CSD using the **CSDDSN** parameter.
7. Define a forward recovery journal identifier using the **CSDFRLOG** parameter. This parameter is ignored if you specify CSDRLS=YES, or if the recovery attributes are defined in the ICF catalog on the **LOG** parameter, in which case LOGSTREAMID from the ICF catalog is used instead. You can set the **NONRLSRECOV** system initialization parameter to FILEDEF if you want CICS to always use the **CSDFRLOG** parameter over the LOGSTREAMID attribute.
8. Define the level of read integrity for a CSD accessed in RLS mode using the **CSDINTEG** parameter.
9. Define an identifier for automatic journaling using the **CSDJID** parameter.
10. Define the VSAM local shared resource pool using the **CSDLSRNO** parameter. This value is ignored if you specify CSDRLS=YES.
11. Define whether or not the CSD is recoverable using the **CSDRECOV** parameter. This parameter is ignored if you specify CSDRLS=YES and CICS uses the **LOG** parameter from the ICF catalog instead. If **LOG** is "undefined", any attempt to open the CSD in RLS mode fails.

    If CSDRLS=NO, this parameter is used only if **LOG** in the ICF catalog is "undefined." By default, if **LOG** in the ICF catalog specifies NONE, UNDO, or ALL, the **LOG** parameter overrides the **CSDRECOV** value. You can set the **NONRLSRECOV** system initialization parameter to FILEDEF if you want CICS to always use the CSDRECOV parameter over the LOG attribute.
12. Define whether the CSD is accessed in RLS or non-RLS mode using the **CSDRLS** parameter.
13. Define the number of strings for concurrent requests using the **CSDSTRNO** parameter. This value is ignored and a value of 1024 is assumed if you specify CSDRLS=YES.

What to do next

These parameters are described in greater detail in Chapter 15, "Specifying CICS system initialization parameters," on page 115.

Sharing the CSD in non-RLS mode

You can implement the sharing of a CSD that is accessed in a non-RLS mode using LSR or NSR. Sharing the CSD by several CICS regions enables those regions to use the same definitions, and means there is no need for duplicate data sets. This is particularly important in a parallel sysplex environment where a CICSplex might have a number of cloned regions, in which case it is essential that they use the same CSD.

About this task

You can optimize the sharing of a CSD as follows:

Procedure

- Enable more than one user to access the CSD at the same time in a CICS region. If you have specified read and write access for the CSD, all the CEDA users in a CICS region can perform read and write functions. CICS file control manages concurrent access for multiple users within a region, using the attributes specified in the **CSDACC** system initialization parameter.
- Enable several users in different CICS regions to access the CSD at the same time. See "Sharing user access from several CICS regions" for details.
- Enable multiple users to access the CSD in a CICS region.
- Share a CSD by CICS regions in a single MVS image.
- Share a CSD in a multi-MVS environment.
- Enable multiple users access one CSD across CICS or batch regions.
- Share the CSD between different releases of CICS.

Shared user access from the same CICS region

Several users in a CICS region can access the CSD at the same time.

If you have specified read/write access for the CSD, all the CEDA users in a CICS region can perform read and write functions. CICS file control manages concurrent access for multiple users within a region, using the attributes specified in the CSDACC system initialization parameter.

For more information, see "Multiple users of the CSD within a CICS region (non-RLS)" on page 45.

Sharing user access from several CICS regions

Several users in different CICS regions can access the CSD at the same time.

1. Give one CICS region read and write access to the CSD (CSDACC=READWRITE system initialization parameter). That CICS region should be at the latest level, to ensure that obsolete resource attributes from earlier release can still be updated safely. Other CICS regions should be given only read access to the CSD (CSDACC=READONLY system initialization parameter). This ensures that the CSD integrity is preserved for CICS regions in the same MVS image or different MVS images.

2. If you update your shared CSD from one region only, and use CEDA in all the other regions just to install into the required region, specify read/write access for the updating region and read-only for all other regions.
3. If you want to update the CSD from several CICS regions, you can use the CICS transaction routing facility, and MRO or ISC, to enable read-only CICS regions to update the CSD. The procedure to follow is:
   a. Select one region that is to own the CSD (the CSD-owning region), and only in this region specify read/write access for the CSD.
   b. Define the CSD as read-only to other CICS regions.
   c. For all regions other than the CSD-owning region:
      1) Redefine the CEDB transaction as a remote transaction (to be run in the CSD-owning region).
      2) Install the definition and add the group to your group list for these regions.

   You may then use the CEDB transaction from any region to change the contents of the CSD, and use CEDA to INSTALL into the invoking region. You cannot use CEDA to change the CSD in region(s) that do not own the CSD.

   If the CSD-owning region fails, the CSD is not available through the CEDB transaction until emergency restart of the CSD-owning region has completed (when any backout processing on the CSD is done). If you try to install a CSD GROUP or LIST that is the target of backout processing, before emergency restart, you are warned that the GROUP or LIST is internally locked to another user. Do not run an offline VERIFY in this situation, because backout processing removes the internal lock when emergency restart is invoked in the CSD-owning region.

   If you do not want to use the above method, but still want the CSD to be defined as a recoverable resource, then integrity of the CSD cannot be guaranteed. In this case, you must not specify CSDBKUP=DYNAMIC, because the CSD would not be suitable for BWO.
4. You can define several CICS regions with read/write access to the CSD, but this should only be considered if the CICS regions run in the same MVS image, and all are at the latest CICS level.
5. If you give several CICS regions read/write access to the same CSD, and those regions are in the same MVS image, integrity of the CSD is maintained by the SHAREOPTIONS(2) operand of the VSAM definition, as shown in the Figure 8 on page 41.
6. If you give several CICS regions read/write access to the same CSD, and those regions are in different MVS images, the VSAM SHAREOPTIONS(2) operand does not provide CSD integrity, because the VSAMs for those MVS images do not know about each other.

Shared access from CICS regions and DFHCSDUP:

If you want to use the DFHCSDUP utility program in read/write mode to update the CSD, you must ensure that no CICS users are using any of the CEDA, CEDB, or CEDC transactions.

For information about other factors that can restrict access to a CSD, see “Other factors restricting CSD access” on page 48.

For information about the system initialization parameters for controlling access to the CSD, see “Defining CSD attributes” on page 42.

Multiple users of the CSD within a CICS region (non-RLS)

If you have specified read/write access for the CSD, all the CEDA users in a CICS region can perform read and write functions. CICS file control manages concurrent access for multiple users within a region, using the attributes specified in the CSDACC system initialization parameter.

CICS protects individual resource definitions against concurrent updates by a series of internal locks on the CSD. CICS applies these locks at the group level. While CICS is executing a command that updates any element in a group, it uses the internal lock to prevent other RDO transactions within the region from updating the same group. CICS removes the lock record when the updating command completes execution. Operations on lists are also protected in this way.

The number of concurrent requests that may be processed against the CSD is defined by the CSDSTRNO system initialization parameter. Each user of CEDA (or CEDB or CEDC) requires two strings, so calculate the CSDSTRNO value by first estimating the number of users that may require concurrent access to the CSD, and then multiply the number by two.

CEDA issues a diagnostic message if the CSDSTRNO value is too small to satisfy the instantaneous demand on the CSD for concurrent requests. A subsequent attempt to reissue the command succeeds if the conflict has disappeared. If conflicts continue to occur, increase the CSDSTRNO value.

Sharing a CSD by CICS regions within a single MVS image (non-RLS)

The CSD may be shared by a number of CICS regions within the same MVS image.

You can maintain the integrity of the CSD in this situation by coding SHAREOPTIONS(2) on the VSAM definition, as shown in the Figure 8 on page 41. The CICS attributes of the CSD, as viewed by a given region, are defined in the system initialization parameters for that region.

You should consider defining:

- One CICS region with read/write access (CSDACC=READWRITE) to the CSD. That region can use all the functions of CEDA, CEDB, and CEDC.
- Other CICS regions with only read access (CSDACC=READONLY) to the CSD. Such CICS regions can use the CEDC transaction, and those functions of CEDA and CEDB that do not require write access to the CSD (for example, they can use INSTALL, EXPAND, and VIEW, but not DEFINE). You can enable such CICS regions to update the CSD, by using the procedure described in “Sharing user access from several CICS regions” on page 43.

  Note: Read integrity is not guaranteed in a CICS region that has read-only access to a shared CSD. For example, if one CICS region that has full read/write access updates a shared CSD with new or changed definitions, another CICS region with read-only access might not obtain the updated information. This could happen if a control interval (CI) already held by a read-only region (before an update by a read/write region) is the same CI needed by the read-only region to obtain the updated definitions. In this situation, VSAM does not reread the data set, because it already holds the CI. However, you can minimize this VSAM restriction by specifying CSDLSRNO=NONE, and the minimum values for CSDBUFNI and CSDBUFND, but at the expense of degraded performance.

See “Specifying read integrity for the CSD” on page 50 for information about read integrity in a data set accessed in RLS mode.

If you define several CICS regions with read/write access to the CSD, those regions should all be at the latest level. Only one CICS region with read/write access can use a CEDA, CEDB, or CEDC transaction to access the CSD, because the VSAM SHAREOPTIONS(2) definition prevents other regions from opening the CSD.

If you are running CICS with the CSD defined as a recoverable resource (CSDRECOV=ALL), see “Planning for backup and recovery” on page 51 for some special considerations.

You can use CEMT to change the file access attributes of the CSD, or you can use the **EXEC CICS SET FILE** command in an application program. However, ensure that the resulting attributes are at least equivalent to those defined either by CSDACC=READWRITE or CSDACC=READONLY. These parameters allow the following operations on the CSD:

READONLY
Read and browse.

READWRITE
Add, delete, update, read and browse.

Sharing a CSD in a multi-MVS environment (non-RLS)

If you need to share a CSD between CICS regions that are running in different MVS images, you should ensure that only one region has read/write access.

The VSAM SHAREOPTIONS(2) offers no integrity, because the VSAMs running in a multi-MVS environment do not know of each other.

Because of these limitations, active and alternate CICS regions running in different MVS images must not share the CSD with other CICS regions, unless you are using some form of global enqueuing (for example, with global resource serialization (GRS)).

These multi-MVS restrictions also apply to running the offline utility, DFHCSDUP.

Multiple users of one CSD across CICS or batch regions (non-RLS)

There are four types of activity that require access to the CSD.

The types of access needed in the four situations where the CSD are used are shown in Table 4.

Table 4. CSD access

	Type of activity	**Access**
1	CICS region performing initialization (cold or initial start)	Read-only
2	CICS region running one or more CEDA, CEDB, or CEDC transactions	Read/write or read-only (as specified in the CSDACC parameter)
3	Batch region running utility program DFHCSDUP	Read/write or read only, depending on PARM parameter

Table 4. CSD access (continued)

	Type of activity	Access
4	CICS regions performing emergency restart, and CSD file backout is required	Read/write

Note the following limitations when the activities listed in Table 4 on page 46 are attempted concurrently:

1. You cannot run DFHCSDUP in read/write mode in a batch region if any CICS region using the same CSD is running one of the CEDA, CEDB, or CEDC transactions. (The exception is when the CED*x* transactions accessing the CSD are in a region (or regions) for which the CSD is defined as read-only.)
2. None of the CEDx transactions runs if the CSD to be used is being accessed by the DFHCSDUP utility program in read/write mode. (This restriction does not apply if the transaction is run in a region for which the CSD is defined as read-only.)
3. None of the CED*x* transactions runs in a CICS region whose CSD is defined for read-write access if any of the RDO transactions are running in another CICS region that has the CSD defined for read-write access.

A CICS region starting with an initial or cold start opens the CSD for read access only during initialization, regardless of the CSDACC operand. This enables a CICS region to be initialized even if a user on another region or the DFHCSDUP utility program is updating the CSD at the same time. After the group lists are installed, CICS leaves the CSD in a closed state.

On a warm or emergency start, the CSD is not opened at all during CICS initialization if CSDRECOV=NONE is coded as a system initialization parameter. However, if CSDRECOV=ALL is coded, and backout processing is pending on the CSD, the CSD is opened during CICS initialization on an emergency start.

Sharing the CSD between different releases of CICS

Resource attributes become obsolete when they have no relevance for a new release of CICS. CICS continues to display these on CED*x* panels, but they are displayed as protected fields, indicating that they are not supported by this release.

Using the ALTER command on definitions that specify obsolete attributes does not cause the loss of these attributes, so you can safely update resource definitions using this release. If you are sharing the CSD with CICS regions at an earlier release, you can update the unsupported fields by using the PF2 function key to remove the protection when in ALTER mode. (PF2 is designated as the “compatibility” key (COM) on the CEDA or CEDB display panels.) Pressing PF2 converts protected fields to unprotected fields that can you can modify. If you want to use this facility to enable you to share common resource definitions, the rule for sharing between different release levels of CICS is that you must update the CSD from the highest release level.

For information about using the CEDA and CEDB ALTER commands to update resource definitions in compatibility mode, see the *CICS Resource Definition Guide*.

You can also use the CSD utility program, DFHCSDUP, to update resources that specify obsolete attributes. A compatibility option is added for this purpose, which you must specify on the **PARM** parameter of the EXEC PGM=DFHCSDUP statement.

You indicate the compatibility option by specifying COMPAT or NOCOMPAT. The default is NOCOMPAT, which means that you cannot update obsolete attributes.

CICS regions that use DB2

If you share your CSD between different releases of CICS that use DB2®, you must use the DB2 resource definitions appropriate for each release of CICS.

With those releases of CICS that ship the CICS DB2 attachment facility, you must use the CICS-supplied group called DFHDB2. This group is included in the CICS-supplied startup list, DFHLIST, and specifies different program names from the attachment facility provided by DB2.

For earlier releases of CICS that do not provide the DFHDB2 group, you must use your own resource definitions that specify the resource names appropriate for the release of CICS and DB2.

CICS-supplied compatibility groups

If you are sharing the CSD between CICS Transaction Server for z/OS, Version 4 Release 2 and an earlier release of CICS, you must ensure that the group list you specify on the **GRPLIST** system initialization parameter contains all the CICS-required standard definitions.

When you upgrade the CSD to the CICS Transaction Server for z/OS, Version 4 Release 2 level, some of the IBM groups referenced by your group list are deleted and the contents transferred to one of the compatibility groups, DFHCOMP*x*. To ensure that these continue to be available to your CICS regions of earlier releases, add the compatibility groups *after* all the other CICS-supplied definitions.

For information about upgrading your CSD, and about the compatibility groups in CICS Transaction Server for z/OS, Version 4 Release 2, see the *CICS Resource Definition Guide*.

Other factors restricting CSD access

Access to the CSD may also be restricted if it is left open after abnormal termination of a CEDA, CEDB, or CEDC transaction.

If the CSD is left open with write access, this prevents other address spaces from subsequently opening it for write access. This situation can be remedied by using CEMT to correct the status of the CSD.

Access to the CSD is not released until the RDO transaction using it is ended, so users of CEDA, CEDB, and CEDC should ensure that a terminal running any of these transactions is not left unattended. Always end the transaction with PF3 as soon as possible. Otherwise, users in other regions are unable to open the CSD.

There may be times when you cannot create definitions in a group or list. This situation arises if an internal lock record exists for the group or list you are trying to update. If you are running the DFHCSDUP utility program (or a CEDA transaction) when this occurs, CICS issues a message indicating that the group or list is locked. As described under "Multiple users of the CSD within a CICS region (non-RLS)" on page 45, this is normally a transient situation while another user within the same region is updating the same group or list. However, if a failure occurs, preventing a CEDA transaction from completing successfully, and CSDRECOV=NONE is coded, the internal lock is not removed and is left in force. (If CSDRECOV=ALL is coded, the CSD is recoverable and file backout occurs and frees the lock.) This could happen, for example, if a system failure occurs while a

CEDA transaction is running; it could also happen if the CSD becomes full. You can remedy this situation by running the DFHCSDUP utility program with the VERIFY command.

However, if you have coded CSDRECOV=ALL, make sure no backout processing is pending on the CSD before you run an offline VERIFY. The effect of coding CSDRECOV=ALL is discussed more fully under "Planning for backup and recovery" on page 51.

Sharing the CSD in RLS mode

This section discusses the use of VSAM RLS to enable the CSD to be shared between a number of CICS regions.

About this task

The reasons for, and benefits of, sharing the CSD are the same regardless of the access mode. However, there are some RLS-related factors that you need to consider if you decide to operate CICS with the CSD in RLS mode.

The following requirements and rules apply to using the CSD in RLS-mode:

- Your CICS regions must run in an RLS-capable environment. That is, all the CICS regions must reside in a parallel sysplex, and an SMSVSAM server must be running in each MVS image that supports one or more CICS regions.
- The CSD must reside in SMS-managed storage.
- You must specify CSDRLS=YES in all CICS regions that are sharing the CSD in RLS-mode, and RLS must be enabled in each region (by the RLS=YES system initialization parameter).
- As soon as the first CICS region opens the CSD in RLS mode, it can only be opened in RLS mode by other CICS regions. If a CICS region attempts to open the CSD in non-RLS mode when it is open in RLS mode by other regions, the non-RLS open request fails.

  Note: This rule means that you cannot use a CSD in RLS mode on a CICS release that supports RLS and share it with CICS regions that do not support RLS. The sharing by non-RLS capable regions means that a CSD can only be use in non-RLS mode.
- All the rules governing the use of a data set in RLS mode apply also to the CSD—there are no special rules for the CSD because it is a CICS system data set.
- Any number of CICS regions can open the CSD in RLS mode and all can use CEDA to update the data set with full integrity. The CICS regions can reside in different MVS images, but the MVS images must be in the same sysplex. There is no need to restrict updating to only one CICS region as in the case of non-RLS sharing, and you can specify the CSDACC=READWRITE system initialization parameter for all CICS regions that specify CSDRLS=YES.

Differences in CSD management between RLS and non-RLS access

Although a CSD accessed in RLS mode is protected by VSAM RLS locking, this operates at the CICS file control level. It does not change the way the CEDA and CEDB transactions manage the integrity of CSD groups.

The CED*x* transactions protect resource definitions in the same way for RLS mode and non-RLS mode CSDs. They protect individual resource definitions against concurrent updates by a series of internal locks on the CSD. The RDO transactions apply these locks at the group level. While RDO transactions are executing a command that updates any element in a group, they use the internal lock to prevent other RDO transactions within a CICS region from updating the same group. The locks are freed only when the updating command completes execution. Operations on lists are protected in the same way. However, in an RLS environment, these internal locks affect all CICS regions that open the CSD in RLS mode. In the non-RLS case they apply only to the CICS region that has the data set open for update (which can only be a single region).

The use of a single buffer pool by the SMSVSAM server removes some of the problems of sharing data that you get with a non-RLS CSD.

Some other points to note are:

- If a CSD is defined with CSDACC=READWRITE and CSDRLS=YES, more than one CICS region can open the CSD concurrently. However, file control closes the CSD opened in RLS mode at termination of each CED*x* transaction, in the same way as for a non-RLS CSD. CSDACC=READONLY is not necessary for a CSD accessed in RLS mode.
- The number of concurrent requests that can be processed against the CSD, is always 1024 for RLS. Diagnostic messages about CSDSTRNO value do not occur for RLS-mode CSDs.
- The VSAM cluster definition SHAREOPTIONS parameter is ignored by SMSVSAM when an application, such as CICS, opens a data set in RLS mode.
- A CSD accessed in RLS mode could give rise to RDO transaction failures that do not occur for a non-RLS mode CSD: For example:
  - An RDO transaction could be holding an RLS exclusive lock while it updates a record, which causes another RDO transaction to time out.
  - If the CSD is recoverable and CICS or MVS fails, update locks of failed-inflight RDO transactions are converted into retained locks. This could result an RDO transaction receiving a LOCKED response from VSAM which, in turn, would cause the RDO transaction to fail.

Specifying read integrity for the CSD

You can specify that you want read integrity for a CSD opened in RLS mode.

This ensures that CED*x* INSTALL command always installs the latest version of a resource definition. The CEDA INSTALL command has to wait for a lock on any CSD record that it is trying to install if another CED*x* transaction is updating the record. The install completes only when the updating task has finished updating the record and released its exclusive lock.

Although the CSDINTEG system initialization parameter supports both consistent and repeatable read integrity, consistent read integrity should provide all the benefit you need for your RDO operations.

Specifying file control attributes for the CSD

You specify file control attributes for the CSD using the CSD*xxxxx* system initialization parameters, with a few exceptions.

These exceptions are as follows:

CSDBKUP
You specify backup-while-open support for the CSD using the VSAM **BWO** parameter in the ICF catalog.

CSDBUFND
: Ignored.

CSDBUFNI
: Ignored.

CSDFRLOG
: You specify the forward recovery log stream for the CSD using the VSAM **LOGSTREAMID** parameter in the ICF catalog.

CSDINTEG
: You specify read integrity for RDO transactions (CED*x*) using this system initialization parameter.

CSDLSRNO
: Ignored.

CSDRECOV
: You specify the recovery attributes for the CSD using the VSAM **LOG** parameter in the ICF catalog. If **LOG** is "undefined", any attempt to open the CSD in RLS mode will fail.

CSDSTRNO
: For RLS, the number of strings defaults to 1024.

Effect of RLS on the CSD batch utility DFHCSDUP

You can use DFHCSDUP to update a **non-recoverable** CSD in RLS mode while CICS also has the CSD open for update in RLS mode.

To enable DFHCSDUP to update the CSD in RLS mode, specify RLS=NRI or RLS=CR in the DD statement for the CSD in the DFHCSDUP JCL. Generally, DFHCSDUP does not perform as well in RLS mode as in non-RLS mode.

You cannot run DFHCSDUP while CICS regions have the CSD open in RLS mode if the CSD is defined as recoverable. This is because a non-CICS job, such as DFHCSDUP, is not allowed to open a recoverable data set for output in non-RLS mode while it is already open in RLS mode. Therefore, before you can run DFHCSDUP, you must quiesce the CSD by issuing a CEMT, or an EXEC CICS, SET DSNAME(...) QUIESCED command.

A recoverable CSD is unavailable to all CICS regions while DFHCSDUP is running until it is unquiesced, which makes it available again in RLS mode. To unquiesce the CSD at the end of the DFHCSDUP run, issue a CEMT, or an EXEC CICS, DSNAME(...) UNQUIESCED command.

For a recoverable CSD, the main factor to consider when planning whether to use RLS is how much you use DFHCSDUP compared with the CED*x* transactions. If you use DFHCSDUP frequently to update your production CSD, you may decide that it is better to use the CSD in non-RLS mode. On the other hand, if you use DFHCSDUP only occasionally, and you want the ability to update the CSD online from any CICS region, use RLS.

Planning for backup and recovery

To guard against system failures that affect your CSD, take a backup of the CSD at regular intervals. Then, if the CSD is corrupted for any reason, you can restore it to its state at the last backup.

About this task

To keep the backup of the CSD as up-to-date as possible, make an image copy of your CSD before each period of update activity, either by an RDO transaction or DFHCSDUP.

Alternatively, because the CSD is open for update whenever RDO work is taking place, it is a good candidate for eligibility for BWO. If the CSD is specified as eligible for BWO, and the data set is corrupted, you can restore a BWO image of the CSD using DFSMSdss, then run forward recovery to the point of corruption using a forward recovery utility.

For a CSD opened in RLS mode, the recovery attributes must be defined in the ICF catalog entry for the CSD, and CICS uses the forward recovery log's log stream name (LSN) from the ICF catalog.

For a CSD opened in non-RLS mode, the recovery attributes can be defined in the ICF catalog entry for the CSD, or on the CSD system initialization parameters. The forward recovery log stream name (LSN) is retrieved from either CSDFRLOG or the ICF catalog. If LOG is defined in the catalog, the forward recovery log stream specified in the catalog is used. If LOG is not defined, the CSDFRLOG journal ID is used to determine the log stream name. If the **NONRLSRECOV** system initialization parameter is set to FILEDEF, the CSDFRLOG journal ID is always used to determine the log stream name. Any recovery attributes specified on the ICF catalog are ignored.

For a CSD opened in non-RLS mode, you can use the system initialization parameter CSDBKUP=DYNAMIC|STATIC to indicate whether the CSD is eligible for BWO. Specify CSDBKUP=DYNAMIC for BWO support, or STATIC (the default) for a "normal" quiesced backup. If you specify BWO support for the CSD you must also define it as forward recoverable. For more information about BWO, see "Defining backup while open (BWO) for VSAM files" on page 8.

For a CSD opened in RLS mode, you must specify all recovery attributes, which includes backup, in the ICF catalog. BWO backup eligibility is specified using BWO(TYPECICS).

If you specify forward recovery for the CSD, changes (after images) made by CICS to the CSD are logged in the forward recovery log stream. Using the latest backup, and the after images from forward recovery log stream, you can recover all the changes made by running a recovery program, such as the CICS VSAM forward recovery utility. After performing forward recovery, you must reenter any CEDA transactions that were running at the time of failure, as these are effectively backed out by the forward recovery process. You can find details of these in the CSDL transient data destination, which is the log for copies of all CEDA commands. See "Logging RDO commands" on page 55 for more information.

Recoverability, forward recovery log stream names, and BWO eligibility can be defined optionally in the ICF catalog for a non-RLS accessed CSD, but must be defined the ICF catalog if the CSD is accessed in RLS mode.

The CSDBKUP, CSDRECOV, and CSDFRLOG system initialization parameters interact according to how they are specified. Table 5 on page 53 and Table 6 on page 53 summarize their effects when the SIT is assembled and during CICS override processing, respectively.

Table 5. CSDBKUP and related parameters at SIT assembly time for CSDRLS=NO

CSDRECOV	CSDFRLOG	CSDBKUP	Result
ALL	FRLOG from 01 through 99.	Either DYNAMIC or STATIC	OK
ALL	NO	Either DYNAMIC or STATIC	SIT assembly fails with MNOTE stating that CSDRECOV=ALL implies that the CSDFRLOG option must be specified.
BACKOUTONLY or NONE	FRLOG from 01 through 99.	DYNAMIC	SIT assembly fails with assembler MNOTES stating that CSDBKUP=DYNAMIC requires CSDRECOV=ALL and that CSDFRLOG requires CSDRECOV=ALL.
BACKOUTONLY or NONE	NO	DYNAMIC	SIT assembly fails with an assembler MNOTE stating that CSDBKUP=DYNAMIC requires CSDRECOV=ALL.
BACKOUTONLY or NONE	NO	STATIC	OK
BACKOUTONLY or NONE	FRLOG from 01 through 99.	STATIC	SIT assembly warning MNOTE stating that CSDFRLOG is ignored unless CSDRECOV=ALL.

Note:
1. When CSDBKUP=DYNAMIC, the CSD is eligible for BWO.
2. Backup and recovery attributes must be specified in the ICF catalog for a CSD opened in RLS mode (CSDRLS=YES).
3. Backup and recovery attributes can optionally be specified in the ICF catalog for a CSD opened in non-RLS mode (CSDRLS=NO), but you must still have a consistent set of parameters as defined in the table above.

Table 6. CSDBKUP and related system initialization parameters during CICS override processing (CSDRLS=NO)

CSDRECOV	CSDFRLOG	CSDBKUP (see Notes)	Result
ALL	FRLOG from 01 through 99.	Either DYNAMIC or STATIC.	OK
ALL	NO	Either DYNAMIC or STATIC.	Message DFHPA1944 is issued stating that CSDRECOV=ALL cannot be specified without a CSDFRLOG if CSDRLS=NO. CICS initialization is terminated.
BACKOUTONLY or NONE	FRLOG from 01 through 99.	DYNAMIC	Processing continues and messages DFHPA1929, stating that CSDBKUP has defaulted to STATIC, and DFHPA1930, stating that CSDFRLOG has been ignored, are issued.

Table 6. CSDBKUP and related system initialization parameters during CICS override processing (CSDRLS=NO) (continued)

CSDRECOV	CSDFRLOG	CSDBKUP (see Notes)	Result
BACKOUTONLY or NONE	NO	DYNAMIC	Processing continues and message DFHPA1929 is issued, stating that CSDBKUP has defaulted to STATIC.
BACKOUTONLY or NONE	NO	STATIC	OK
BACKOUTONLY or NONE	FRLOG from 01 through 99.	STATIC	Processing continues and message DFHPA1930 stating that CSDFRLOG has been ignored is issued.

Note:

1. When CSDBKUP=DYNAMIC, the CSD is eligible for BWO.
2. Backup and recovery attributes must be specified in the ICF catalog for a CSD opened in RLS mode (CSDRLS=YES).
3. Backup and recovery attributes can optionally be specified in the ICF catalog for a CSD opened in non-RLS mode (CSDRLS=NO), but you must still have a consistent set of parameters as defined in the table above.

Write and test procedures for backing up and recovering your CSD before beginning to operate a production CICS region.

Forward recovery of the CSD is not possible if CSD updates are made outside CICS. To enable recovery of the updates made outside CICS, you need to use an image copy. If you update the CSD from outside CICS, do not use CEDA to update the CSD until an image copy has been made.

Transaction backout during emergency restart

If you define the CSD as a recoverable resource, by coding the **CSDRECOV** system initialization parameter, the same rules apply to the CSD as to any other CICS recoverable resource.

If you code CSDRECOV=ALL (or BACKOUTONLY) as a system initialization parameter, and have to perform an emergency restart following a failure, CICS backs out any incomplete RDO transactions that were in-flight at the time of failure.

Dynamic backout for transactions

CICS performs dynamic transaction backout for any RDO transaction abends.

You cannot decide whether you want dynamic transaction backout by coding an attribute on transaction definitions in the CSD; CICS assumes this requirement for all transactions. (Defining the CSD as non-recoverable has the effect of preventing backout, but this is not recommended.)

Other recovery considerations

When you are deciding what recoverability options to specify, you must consider a number of factors.

These factors are as follows:
- CEDA command syncpoint criteria
- Sharing the CSD with another CICS region
- Accessing the CSD by the offline utility program DFHCSDUP

For information about CEDA command syncpoint criteria, see "CEDA command syncpoint criteria." For information about sharing the CSD between CICS regions, see "Sharing the CSD in non-RLS mode" on page 43. For information about using the DFHCSDUP utility to access the CSD, see "Accessing the CSD by the offline utility program, DFHCSDUP."

CEDA command syncpoint criteria

You can issue a CEDA command on the command line, or issue the command as a series of single commands from an EXPAND or DISPLAY panel.

Commands that change the contents of the CSD commit or back out changes at the single command level. The exception to this rule is a generic ALTER command. A generic ALTER command is committed or backed out at the single resource level.

The replacement of an existing resource definition by an INSTALL command only occurs if the resource is not in use. If any of the resources in the group being installed are in use, the install will fail.

Changes made to the following resource definitions by an INSTALL command are committed at the resource level and are not backed out if the install fails:
- AUTOINSTALL MODEL,FILE, LSRPOOL, MAPSET, PARTITIONSET, PARTNER, PROFILE, PROGRAM, TDQUEUE, and TRANSACTION,

Changes made to the following resource definitions by an INSTALL command are committed at the group level and are backed out if the install fails:
- CONNECTION, SESSION, TERMINAL, and TYPETERM

Accessing the CSD by the offline utility program, DFHCSDUP

Changes made to the CSD by the offline utility program DFHCSDUP are not recoverable.

Also consider the effects of using commands provided by this program, before emergency restart of a failing CICS region, that:
1. Change the contents of lists or groups that are the target of backout processing.
2. Remove internal locks (by using VERIFY, for example).

These situations are analogous to the problems met when using multiple read/write regions, and are discussed above.

Logging RDO commands

If you want to record RDO commands, use the sample job to create definitions for the extrapartition queues CADL, CAIL, CRDI, CSDL, CSFL, CSKL, CSLB, CSPL, and CSRL.

About this task

These queues are used as follows:

CADL Logs z/OS Communications Server resources installed in the active CICS region. CICS records in this log all z/OS Communications Server resources installed, z/OS Communications Server resources deleted, and dynamically installed z/OS Communications Server resources that are discarded. This log includes autoinstalled terminal definitions, terminal definitions installed explicitly by the CEDA INSTALL command, and terminal definitions installed from a group list during system initialization.

CAIL Logs the dynamic installation and deletion of autoinstall terminal models.

CRDI Logs installed resource definitions, such as programs, transactions, mapsets, profiles, partition sets, files, and LSR pools.

CSDL Logs RDO commands that affect the CSD.

CSFL Logs file resources installed in the active CICS region. That is, all file resource definitions that are installed or deleted, dynamically installed file resource definitions that are discarded, and messages from dynamic allocation of data sets and from loading CICS data tables.

CSKL Logs transaction and profile resources installed in the active CICS region. That is, all transaction and profile resource definitions that are installed or deleted, and dynamically installed transaction and profile resource definitions that are discarded.

CSLB Logs changes to the dynamic LIBRARY resources installed in the active CICS region. That is, install and discard changes, and any changes to the enablement, ranking or critical status of the LIBRARY. If no dynamic LIBRARY resources are installed, no audit logging will take place.

CSPL Logs program resources installed in the active CICS region. That is, all program resource definitions that are installed or deleted, and dynamically installed program resource definitions that are discarded.

CSRL Logs changes to the set of partner resources installed in the active CICS region. That is, all operations that install or discard partner resources.

If you want these RDO command logs sent to the same destination (CSSL) as the messages, you can use the definitions shown in Figure 9 on page 57. If you like, you can direct these logs to any other transient data queue, or define them as extrapartition data sets.

Note: VTAM® is now z/OS Communications Server.

```
*
DEFINE TDQUEUE (CSSL)        GROUP(DFHDCTG)
       DESCRIPTION(USED FOR MESSAGES)
       TYPE(EXTRA)           TYPEFILE(OUTPUT)
       RECORDSIZE(132)       BLOCKSIZE(136)
       RECORDFORMAT(VARIABLE) BLOCKFORMAT(UNBLOCKED)
                             DDNAME(MSGUSR)
*
DEFINE TDQUEUE (CADL)        GROUP(DFHDCTG)
       DESCRIPTION(CEDA VTAM RESOURCE LOGGING)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CAIL)        GROUP(DFHDCTG)
       DESCRIPTION(AITM MESSAGES)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CRDI)        GROUP(DFHDCTG)
       DESCRIPTION(RDO INSTALL LOG)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSLB)        GROUP(DFHDCTG)
       DESCRIPTION(CICS LD Domain LIBRARY Audit Trail)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSDL)        GROUP(DFHDCTG)
       DESCRIPTION(CEDA COMMAND LOGGING)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSFL)        GROUP(DFHDCTG)
       DESCRIPTION(FILE ALLOCATION MESSAGES)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSKL)        GROUP(DFHDCTG)
       DESCRIPTION(TRANSACTION MANAGER MESSAGES)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSPL)        GROUP(DFHDCTG)
       DESCRIPTION(PROGRAM MANAGER MESSAGES)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
*
DEFINE TDQUEUE (CSRL)        GROUP(DFHDCTG)
       DESCRIPTION(PARTNER RESOURCE MANAGER)
       TYPE(INDIRECT)        INDIRECTNAME(CSSL)
```

Figure 9. Definitions for RDO command logs sent to CSSL

Making the CSD available to CICS

To make your CSD available to CICS, you can either include a DD statement in the CICS startup job or use dynamic allocation.

About this task

Procedure

1. Include the following DD statement in your CICS startup job stream:

   ```
   //DFHCSD  DD  DSN=CICSTS42.CICS.applid.DFHCSD,DISP=SHR
   ```

   You usually need the CSD DD statement to include DISP=SHR. (See “Sharing the CSD in non-RLS mode” on page 43.) If you include a DD statement for the

CSD in the CICS startup job, the CSD is allocated at the time of CICS job step initiation and remains allocated for the duration of the CICS job step.

2. To dynamically allocate the CSD, specify the data set name (DSNAME) and disposition (DISP) of the CSD, using one of the following methods:
   - The **CSDDSN** and **CSDDISP** system initialization parameters
   - The **CEMT SET FILE** command
   - The **EXEC CICS SET FILE** command

   Do not provide a DD statement for the CSD in the startup job stream. If there is a CSD DD statement, it is used instead of dynamic allocation. CICS uses the full data set name (DSNAME) to allocate the CSD as part of OPEN processing. The CSD is automatically deallocated when the last entry associated with it is closed.

What to do next

For more information about OPEN processing, see Chapter 9, "Defining user files," on page 81. For information about the parameters that you can code for the CSD in the SIT, see Chapter 15, "Specifying CICS system initialization parameters," on page 115.

Installing the RDO transactions

The RDO transactions, CEDA, CEDB, and CEDC are defined in the CICS-supplied group, DFHSPI.

This group is also included in DFHLIST, the CICS group list. Ensure that a copy of DFHSPI is included in the group list that you use for your CICS startup. You specify the group list on the GRPLIST system initialization parameter.

For information about the CEDA, CEDB, and CEDC transactions, see *CICS Supplied Transactions*.

Installing definitions for the Japanese language feature

If you have the Japanese language feature, install the definitions for the feature in the CSD, by running DFHCSDUP.

When you run DFHCSDUP, specify the following option:

```
UPGRADE USING(DFHRDJPN)
```

For information about the DFHCSDUP utility program and the available commands, see the *CICS Resource Definition Guide*.

Chapter 6. Setting up the catalog data sets

You must define and initialize new CICS catalogs for CICS Transaction Server for z/OS, Version 4 Release 2.

About this task

You must define the CICS global catalog data set and the CICS local catalog data set, which CICS requires to catalog CICS system information. Throughout the documentation, these data sets are referred to as the global catalog and the local catalog. The CICS catalog data sets are not connected with MVS system catalogs and contain data that is unique to CICS.

For information on how CICS uses the catalogs, including startup and restart, see "The role of the CICS catalogs" on page 294

To estimate the amount of space needed in your global catalog, see "Space calculations" on page 61

To set up the catalog data sets:

Procedure

1. Define the global catalog.
2. Define the local catalog.

Defining the global catalog

The global catalog is a VSAM key-sequenced data set (KSDS) is used to store start type information, location of the CICS system log, resource definitions, terminal control information and profiles.

About this task

CICS uses the global catalog to perform the following activities:

- To record information that governs the possible types of start and the location of the CICS system log.
- During the running of CICS, to hold the resource definitions that are installed during initialization when CICS installs the group list, by the RDO **CEDA INSTALL** command or by the **EXEC CICS CREATE** command.
- During a normal shutdown, to record terminal control information and profiles. All other warm keypoint information is written to the CICS system log.

You must ensure that the REGION parameter on your CICS jobs is high enough to cope with the increase in buffer storage used for the global catalog, because this storage comes out of region storage not EDSA.

You can define and initialize the CICS global catalog in two ways. You can use the sample job as described below, or you can use the CICS-supplied job, DFHDEFDS.

Edit the sample job:

Procedure

1. Edit the data set name in the CLUSTER definition to be the same as the DSN parameter in the DD statement for the global catalog in the CICS startup job stream.
2. The primary and secondary extent sizes are shown as *n1* and *n2* cylinders. Calculate the size required to meet your installation requirements, and substitute your values for *n1* and *n2*. Whichever **IDCAMS** parameter you use for the global catalog data set space allocation (CYLINDERS, TRACKS, or RECORDS), make sure that you specify a secondary extent. CICS abends if your global catalog data set fills and VSAM cannot create a secondary extent. For information about record sizes, see Table 7 on page 62
3. Specify the REUSE option on the **DEFINE CLUSTER** command. This option enables the global catalog to be opened repeatedly as a reusable cluster. Also specify REUSE if you intend to use the COLD_COPY input parameter of the DFHRMUTL utility.
4. Edit the *CONTROLINTERVALSIZE* values for the VSAM definition if required. This job does not specify a minimum or maximum buffer size explicitly, but accepts the default that is set by VSAM. You can code an explicit value if you want to define buffers of a specific size. See "Buffer space sizings" on page 64 for more information.
5. Use the recovery manager utility program, DFHRMUTL, to initialize the data set. Specify this utility in the job step INITGCD. DFHRMUTL writes a record to the data set, specifying that on its next run using this global catalog, if START=AUTO is specified, CICS is to perform an initial start and not prompt the operator for confirmation. This record is called the autostart override record.
6. Add a job step to run the DFHCCUTL utility. Adding this step means that the global and local catalogs do not get out of step.
7. Define the data definition statement for CICS as:
   ```
   //DFHGCD  DD  DSN=CICSTS42.CICS.applid.DFHGCD,DISP=OLD
   ```
   This example shows the minimum specification for a global catalog for use by a single CICS region.
8. Add the relevant **AMP** subparameters to the DD statement to help improve restart and shutdown time. The **AMP** parameter is described in *z/OS MVS JCL Reference* and an example is shown in the CICS startup job stream in Chapter 18, "CICS startup," on page 305.

Example

```
//GLOCAT   JOB accounting info,,CLASS=A
//DEFGCD   EXEC PGM=IDCAMS
//SYSPRINT DD   SYSOUT=*
//SYSIN    DD   *
      DEFINE CLUSTER -
               (NAME(CICSTS42.CICS.applid.DFHGCD) -
               INDEXED                      -
               CYLINDERS(n1 n2)             -
               FREESPACE(10 10)             -
               SHAREOPTIONS(2)              -
               RECORDSIZE(4089 32760)       -
               REUSE                        -
               VOLUMES(volid))              -
             DATA                           -
               (NAME(CICSTS42.CICS.applid.DFHGCD.DATA)  -
               CONTROLINTERVALSIZE(32768)    -
               KEYS(52 0))                  -
             INDEX                          -
               (NAME(CICSTS42.CICS.applid.DFHGCD.INDEX) )
/*
//INITGCD  EXEC PGM=DFHRMUTL,REGION=1M
//STEPLIB  DD DSNAME=CICSTS42.CICS.SDFHLOAD,DISP=SHR
//SYSPRINT DD SYSOUT=A
//DFHGCD   DD DSNAME=CICSTS42.CICS.applid.DFHGCD,DISP=OLD
//SYSIN    DD *
SET_AUTO_START=AUTOINIT
/*
```

Figure 10. Example job to define and initialize the global catalog

Space calculations

Estimate the amount of space needed in your global catalog to keypoint installed resource definitions, table entries, and control blocks. Each global catalog record has a 52-byte key. Each entry is one VSAM record, and the records for each type of table have different keys.

You must regularly review your space usage to ensure that extents are not running too close to the limit for your environment. Use the sizes specified in Table 7 on page 62 to estimate the amount of space needed in your global catalog.

The space requirements for a VSAM KSDS such as DFHGCD can vary for different CICS cold starts. They can vary when no changes have been made to the CICS definitions that are going to be stored on the VSAM KSDS, because VSAM uses the space in the data set differently depending on whether the data set has just initialized or has data from a previous run of CICS. CICS calls VSAM to perform sequential writes. VSAM honors the **freespace**value specified on the data set's definition if the keys of the records being added sequentially are higher than the highest existing key. However, if the data set contains existing records with a higher key than the ones being inserted, the **freespace** value is only honored after a CI split has occurred.

The size of the index portion of the data set can also vary depending on the number of CI and CA splits that have occurred. The size affects the index sequence set.

When you are initializing the global catalog, you can use the **COLD_COPY** parameter; for example, SET_AUTO_START=AUTOCOLD,COLD_COPY. The cold copy creates a reduced copy of the global catalog data set, which improves the performance of the cold start. The CI splits cease after the first cold start and the data set will not expand into additional extents. Alternatively, you can reorganize or reinitialize the data set from time to time.

Note: In Table 1, the **Number of bytes per entry** column includes the 52-byte key length.

Table 7. Sizes for entries in the global catalog

Installed definition, table entry, or control block	Number of bytes per entry	Size in previous release if different
Installed ATOMSERVICE definition	660 bytes	
Installed BUNDLE definition 1	300 bytes up to 800 bytes approximately	
Installed CONNECTION definition	528 bytes	440 bytes
Installed CORBASERVER definition	1304 bytes	1216 bytes
Installed DB2CONN definition	1548 bytes	1460 bytes
Installed DB2 ENTRY definition	332 bytes	244 bytes
Installed DB2TRAN definition	160 bytes	62 bytes
Installed DJAR definition	432 bytes	344 bytes
Installed DOCTEMPLATE definition	284 bytes	196 bytes
Installed ENQMODEL definition	152 bytes	64 bytes
Installed EVENTBINDING and CAPTURESPEC definitions 2	4000 bytes approximately	
Installed extrapartition queue definition	392 bytes	296 bytes
Installed FILE definition	588 bytes	500 bytes
Installed indirect queue definition	180 bytes	92 bytes
Installed intrapartition queues definition	328 bytes	240 bytes
Installed IPCONN definition	402 bytes	312 bytes
Installed JOURNALMODEL definition	168 bytes	80 bytes
Installed JVM Program definition	168 bytes up to 307 bytes	80 bytes up to 219 bytes
Installed JVMSERVER definition	146 bytes	
Installed LIBRARY definition	852 bytes	764 bytes
Installed MQCONN definition	620 bytes	
Installed MQINI definition	212 bytes	
Installed PARTNER definition	148 bytes	124 bytes
Installed PIPELINE definition	1500 bytes	1412 bytes
Installed PROCESSTYPE definition	148 bytes	60 bytes
Installed PROFILE definition	158 bytes	70 bytes
Installed PROGRAM definition	168 bytes	44 bytes
Installed REQUESTMODEL definition	226 bytes	138 bytes
Installed remote queue definition	172 bytes	84 bytes
Installed TCPIPSERVICE definition	924 bytes	580 bytes
Installed model TERMINAL definitions 3	634 bytes	610 bytes
Installed TRANCLASS definitions	124 bytes	36 bytes
Installed TRANSACTION definitions (without TPNAME)	244 bytes	140 bytes
Installed TRANSACTION definitions (with TPNAME or XTPNAME)	388 bytes	204 bytes
Installed TSMODEL definition	236 bytes	148 bytes
Installed TYPETERM definitions 3	634 bytes	610 bytes
Installed VSAM file (or data table) definition	312 bytes	288 bytes
Installed URIMAP definition	1316 bytes	1220 bytes

Table 7. Sizes for entries in the global catalog (continued)

Installed definition, table entry, or control block	Number of bytes per entry	Size in previous release if different
Installed WEBSERVICE definition	1040 bytes	936 bytes
BDAM file control table entry (FCT)	284 bytes	146 bytes
BDAM data control blocks	156 bytes	132 bytes
VSAM LSR share control blocks **4**	1224 bytes	1184 bytes
Data set names (JCL or dynamically allocated) **5**	96 bytes	72 bytes
Data set name blocks	194 bytes	170 bytes
Eventprocess status	89 bytes	
File control recovery blocks **6**	149 bytes	125 bytes
Terminal control table entry (TCT)	1552 bytes approximately	1500 bytes approximately
Dump table entry	100 bytes	76 bytes
Interval control element (ICE)	120 bytes	96 bytes
Automatic initiator descriptor (AID)	120 bytes	96 bytes
Deferred work element (DWE) **7**	132 bytes	108 bytes
Installed journal	111 bytes	88 bytes
Recovery manager remote names	158 bytes	134 bytes
Transient data destination record	70 bytes	46 bytes
Transient data destination auxiliary record	58 bytes	34 bytes
Loader program definitions	68 bytes	44 bytes
Session TCTTEs	918 bytes	894 bytes
Log streams	112 bytes	88 bytes
Uri virtual hosts	180 bytes	156 bytes

Notes

1. The size of a bundle catalog record depends on the number of parts that are included in the bundle, the size of the bundle directory, and the length of the scope. The minimum size for a bundle with no scope and small directory is approximately 300 bytes. However, with a scope and large directory, the number of bytes can increase to 800. For each bundle part, the size can also range from 300 to 800 bytes.
2. The size of an event binding catalog record depends on the number of capture specifications in the event binding and the number of filters and capture data items in each capture specification. If required, you might have multiple catalog records for each event binding.
3. The TYPETERM and model TERMINAL definitions are present if you are using autoinstall. They are stored directly in the global catalog when the definitions are installed, either by a CEDA transaction, or as members of a group installed through a group list. For example, if you start CICS with the startup parameter GRPLIST=DFHLIST, the CICS-supplied TYPETERM and model terminal definitions, defined in the groups DFHTERM and DFHTYPE, are recorded in the global catalog. Allocate space in your calculations for all autoinstall resources installed in your CICS region.
4. One for each LSR pool; that is, 8.
5. If you open a VSAM path, you get two of these; for BDAM or VSAM base data sets you get one.
6. You will have these if you use the VSAM RLS SHCDS option NONRLSUPDATEPERMITTED. In this case, for each data set for which you have specified NONRLSUPDATEPERMITTED, you can have an upper limit. This limit is the number of different file names through which you access the

data set multiplied by the number of tasks that update the data set. You will typically have only a few, if any, of these control blocks.

7. The value given is for a DWE chained off an LU6.1 session or an APPC session.

Buffer space sizings

Use the buffer space parameters to define buffers of a specific size in the VSAM definition for the global catalog data set.

You must ensure that the REGION parameter on your CICS jobs is high enough to cope with the increase in buffer storage used for the global catalog, because this storage comes out of region storage not EDSA.

By default, VSAM uses a buffer space equal to twice the control interval size of the data component and the control interval size of the index. In the sample job, this calculation gives a default of 69632 bytes. A larger minimum buffer size can improve cold start and warm restart times, and might significantly reduce CICS shutdown times.

You can use two parameters to control the buffer size. The **BUFFERSPACE** parameter defines the minimum buffer space size that is allowed. The **BUFSP** parameter defines the maximum buffer size. You can add either parameter to the sample job to set an appropriate buffer size.

For performance reasons, CICS defines a STRNO (number of strings) value of 32. Based on the sample job, the minimum value of BUFSP is calculated as follows:

```
BUFND = (STRNO + 1)
BUFNI = STRNO
BUFSP = 33 * 32768 (BUFND * CI size) + 32 * 1024  (BUFNI * CI size) =
        1114112 bytes
```

Another way to define buffer space for the global catalog data set is to use the **AMP** parameter on the DD statement in the CICS startup job stream, which you can use to override the default or defined value. If the **AMP BUFSP** specifies fewer bytes than the **BUFFERSPACE** parameter of the access method services DEFINE command, the **BUFFERSPACE** number overrides the **BUFSP** number.

Reusing the global catalog to perform a cold start

If you need to perform a cold start, **do not** delete and redefine the global catalog data set.

If you were to delete and redefine the global catalog, CICS would perform an *initial* start, and all recovery information for remote systems would be lost. When remote systems reconnected, CICS would inform them that it had lost any information that they needed to resynchronize their units of work, and messages would be produced to record the fact, on both the local and the remote systems.

Instead, to specify that the next start should be cold, use the DFHRMUTL utility with the SET_AUTO_START=AUTOCOLD option. This has the following advantages:

- You do not have to reset the START system initialization parameter from AUTO to COLD, and back again.
- Because sufficient information is preserved on the global catalog and the system log, CICS is able to recover information for remote systems from the log, and to reply to remote systems in a way that enables them to resynchronize their units of work.

You can speed up a cold start by using the DFHRMUTL COLD_COPY option to copy only those records that are needed for the cold start to another catalog data set. If the return code set by DFHRMUTL indicates that the copy was successful, a subsequent job-step can copy the new (largely empty) catalog back to the original catalog data set. The performance gain occurs because, at startup, CICS does not have to spend time deleting all the definitional records from the catalog. This technique will also speed up initial starts, for the same reason. Figure 11 is an example of this technique.

Note: Before you use COLD_COPY, you should be certain that you want to perform a cold or initial start. As a safeguard, make a backup copy of the original global catalog before you copy the new catalog output by DFHRMUTL over it. For more information about the use of the global catalog in a cold start of CICS, see "Controlling start and restart" on page 294.

```
//RMUTL    EXEC PGM=DFHRMUTL,REGION=1M
//STEPLIB  DD DSNAME=CICSTS42.CICS.SDFHLOAD,DISP=SHR
//SYSPRINT DD SYSOUT=A
//DFHGCD   DD DSNAME=CICSTS42.CICS.applid.DFHGCD,DISP=OLD
//NEWGCD   DD DSNAME=CICSTS42.CICS.applid.COPY.DFHGCD,DISP=OLD
//SYSIN    DD *
SET_AUTO_START=AUTOCOLD,COLD_COPY
/*
//         IF (RMUTL.RC<16) THEN
//*  Steps to be performed if RMUTL was a success
//COPY     EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//DFHGCD   DD DSNAME=CICSTS42.CICS.applid.DFHGCD,DISP=OLD
//NEWGCD   DD DSNAME=CICSTS42.CICS.applid.COPY.DFHGCD,DISP=OLD
//SYSIN    DD *
   REPRO INFILE(NEWGCD) OUTFILE(DFHGCD) REUSE
/*
//*  End of steps to be performed if RMUTL was a success
//         ENDIF
```

Figure 11. DFHRMUTL example—setting the global catalog for a cold start. The COLD_COPY option is used to improve startup performance. Note that the NEWGCD and DFHGCD data sets must have been defined with the REUSE attribute.

Defining the local catalog

The local catalog is a VSAM key-sequenced data set (KSDS). The local catalog is not shared by any other CICS region.

Before you begin

Unlike the global catalog, which must be defined with enough space to cope with any increase in installed resource definitions, the size of the local catalog is relatively static. The following section describes the information held on the local catalog.

CICS Transaction Server for z/OS is divided into functional areas (or components) known as domains. These domains communicate through a central component, the CICS kernel, and their initialization and termination is controlled by the domain manager. All the domains require an individual domain parameter record, and these are stored in the local catalog. The CICS domains use the local catalog to save some of their information between CICS runs and to preserve this information across a cold start. For further guidance information about what is written to the local catalog, and about how CICS uses the local catalog for startup and restart, see

"Controlling start and restart" on page 294.

About this task

You can define and initialize the CICS local catalog in two ways. You can use the sample job as described below or you can use the CICS-supplied job, DFHDEFDS, to create a local catalog for an active CICS region.

Edit the sample job as follows:

Procedure

1. If you are defining local catalogs for multiple CICS regions, identify the clusters uniquely by making the specific APPLID of each CICS one of the data set qualifiers. For example, you might use the following names for the clusters of active and alternate CICS regions, where DBDCCIC1 and DBDCCIC2 are the specific APPLIDs:
   ```
   DEFINE CLUSTER -
          (NAME( CICSTS42.CICS.DBDCCIC1.DFHLCD)

   DEFINE CLUSTER -
          (NAME( CICSTS42.CICS.DBDCCIC2.DFHLCD)
   ```
2. Space for 200 records is probably adequate for the local catalog. However, specify space for secondary extents as a contingency allowance.
3. The local catalog records are small in comparison with the global catalog. Use the record sizes shown, which, with the number of records specified, ensure enough space for the data set.
4. Define the data definition statement for the local catalog as follows:
   ```
   //DFHLCD  DD  DSN=CICSTS42.CICS.applid.DFHLCD,DISP=OLD
   ```

Example

```
//LOCAT    JOB accounting info,,CLASS=A
//DEFLCD   EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
//*
         DEFINE CLUSTER -
                (NAME( CICSTS42.CICS.applid.DFHLCD) -  1
                 INDEXED                     -
                 RECORDS( 200 10 )           -                 2
                 FREESPACE(10 10)            -
                 SHAREOPTIONS( 2 )           -
                 REUSE                       -
                 VOLUMES( volid ))           -
           DATA                              -
                (NAME( CICSTS42.CICS.applid.DFHLCD.DATA )   -
                 KEYS( 52 0 )                -
                 RECORDSIZE( 70 2041 )       -                 3
                 CONTROLINTERVALSIZE( 2048 ))  -
           INDEX (NAME( CICSTS42.CICS.applid.DFHLCD.INDEX ) )
/*
//*******************************************************************
//INITLCD EXEC PGM=DFHCCUTL
//*
//*           INITIALIZE THE CICS LOCAL CATALOG
//*
//STEPLIB   DD DSN=CICSTS42.CICS.SDFHLOAD,DISP=SHR
//SYSPRINT  DD SYSOUT=*
//SYSUDUMP  DD SYSOUT=*
//DFHLCD    DD DSN=CICSTS42.CICS.applid.DFHLCD,DISP=SHR
//*
//
```

Figure 12. Sample job to define and initialize the local catalog

Initializing the local catalog

Before the local catalog can be used to start a CICS region, you must initialize it with data from the domain manager parameter records and three loader domain parameter records.

About this task

The domain manager parameter records contain information relating to the CICS domains and are identified by their domain names. See Table 8 on page 68 for a complete list.

The three loader domain parameter records contain information relating to these resources:

- DFHDMP, the CSD file manager
- DFHEITSP, the RDO language definition table
- DFHPUP, the CSD parameter utility program

Procedure

1. To enable you to initialize the local catalog correctly, with all the records in the correct sequence, run the CICS-supplied utility DFHCCUTL immediately after you have defined the VSAM data set. This utility writes the necessary data to the local catalog from the CICS domains.

2. The loader domain also writes a program definition record for each CICS nucleus module. The number of records varies depending on the level of function that you have included in your CICS region. Allow for at least 75 of these loader-domain records.
3. Use the CICS-supplied utility DFHSMUTL to add records to the local catalog to enable the CICS self-tuning mechanism for storage manager domain subpools.

Example

Table 8. List of domain names

Domain name in catalog	Description
DFHAP	Application domain
DFHBA	Business application manager
DFHCC	CICS local catalog domain
DFHDD	Directory manager domain
DFHDH	Document handler domain
DFHDM	Domain manager domain
DFHDP	Debugging profiles domain
DFHDS	Dispatcher domain
DFHDU	Dump domain
DFHEJ	Enterprise Java domain
DFHEM	Event manager domain
DFHEP	Event processing domain
DFHGC	CICS global catalog domain
DFHIE	ECI over TCP/IP domain
DFHII	IIOP domain
DFHKE	Kernel domain
DFHLD	Loader domain
DFHLG	Log manager domain
DFHLM	Lock manager domain
DFHME	Message domain
DFHML	XML services domain
DFHMN	Monitoring domain
DFHNQ	Enqueue manager domain
DFHOT	Object transaction domain
DFHPA	System initialization parameter domain
DFHPG	Program manager domain
DFHPI	Pipeline manager domain
DFHPT	Partner management domain
DFHRL	Resource life-cycle domain
DFHRM	Recovery manager domain
DFHRS	Region status domain
DFHRX	RRMS domain

Table 8. List of domain names (continued)

Domain name in catalog	Description
DFHRZ	Request streams domain
DFHSH	Scheduler services domain
DFHSJ	JVM domain
DFHSM	Storage manager domain
DFHSO	Sockets domain
DFHST	Statistics domain
DFHTI	Timer domain
DFHTR	Trace domain
DFHTS	Temporary storage domain
DFHUS	User domain
DFHWB	Web domain
DFHW2	Web 2.0 domain
DFHXM	Transaction manager domain
DFHXS	Security domain

Domains that write to the local catalog

Some domains write a domain status record to the local catalog, for use in a warm or emergency restart. For example, in the case of the dump domain, the status record indicates which transaction dump data set was in use during the previous run.

The domains that write to the local catalog are:
- Dispatcher domain
- Dump domain
- Loader domain
- Message domain
- Parameter manager domain
- Storage manager domain
- Transient data

Chapter 7. Setting up auxiliary trace data sets

CICS trace entries can be directed to auxiliary trace data sets, which are CICS-owned BSAM data sets. If you want to use auxiliary trace, you must create the data sets before you start CICS; you cannot define them while CICS is running.

About this task

You can choose from three destinations for trace data that is handled by the CICS trace domain. Any combination of these three destinations can be active at any time:

- The internal trace table, in main storage in the CICS address space.
- The auxiliary trace data sets, defined as BSAM data sets on disk or tape.
- The z/OS generalized trace facility (GTF) data sets.

Auxiliary trace has the following advantages:

- You can collect large amounts of trace data, if you initially define large enough trace data sets. For example, you might want to do this to trace system activity over a long period of time, perhaps to solve an unpredictable storage violation problem.
- You can use the auxiliary switch (**AUXTRSW** system initialization parameter) to specify that auxiliary trace data cannot be overwritten by subsequent trace data. With the internal trace table, when the end of the table is reached subsequent entries overwrite those at the start of the table, and diagnostic information is lost.
- Auxiliary trace can be particularly useful if you are using CICS trace during startup, because of the high volume of trace entries that are written when CICS is initializing.

Auxiliary trace is held in one or two sequential data sets, on either disk or tape. The DD names of the auxiliary trace data sets are defined by CICS as DFHAUXT and DFHBUXT. If you define a single data set only, its DD name must be DFHAUXT.

Trace entries are of variable length, but the physical record length (block size) of the data that is written to the auxiliary trace data sets is fixed at 4096 bytes. As a rough guide, each block contains an average of 40 trace entries, although the actual number of trace entries depends on the processing that is being performed.

Procedure

1. Decide whether to define one or two sequential data sets for auxiliary trace. If you want to specify automatic switching for your auxiliary trace data sets, you must define two data sets. If you specify automatic switching for auxiliary trace, but define only one data set, auxiliary trace is stopped and a system dump is generated.
2. Decide on the location of the auxiliary trace data sets. If you use tape for recording auxiliary trace output, use unlabeled tape. Using standard-labeled tape, whether on a single tape drive or on two tape drives, stops you processing the contents of any of the volumes with the DFHTU670 utility until after the CICS step has been completed. If you have to use standard-labeled

tape, make sure all the output produced in the CICS run fits on the one (or two) volumes mounted. You cannot catalog data sets that are on unlabeled tapes.

3. If you are defining auxiliary trace data sets on disk, allocate and catalog the auxiliary trace data sets before you start CICS. Use one of the following methods:
   - Use the sample job shown in "Sample job to allocate auxiliary trace data sets" to allocate and catalog the data sets.
   - Use the supplied job DFHDEFDS to create the auxiliary trace data sets. For more information, see Creating the CICS data sets in the Installation Guide.
4. If you are using tape for the auxiliary data sets, and you want auxiliary trace to be active from CICS startup, assign tape units and mount the tapes before you start CICS. If you plan to start auxiliary trace by entering a command when CICS is running, ensure the tapes are mounted before you enter the command.
5. Define the auxiliary trace data sets to CICS in the startup job stream.
   a. For auxiliary trace data sets on disk, use the following DD statements:
   ```
   //DFHAUXT  DD  DSN=CICSTS42.CICS.applid.DFHAUXT,DCB=BUFNO=n,DISP=SHR
   //DFHBUXT  DD  DSN=CICSTS42.CICS.applid.DFHBUXT,DCB=BUFNO=n,DISP=SHR
   ```
   If you specify BUFNO greater than 1, you can reduce the I/O overhead involved in writing auxiliary trace records. A value between 4 and 10 can greatly reduce the I/O overhead when running with auxiliary trace on. DISP=SHR allows the simultaneous processing of a data set by the DFHTU670 offline utility program after a switch to the other data set has taken place.
   b. For auxiliary trace data sets on unlabeled tapes, use the following sample DD statements:
   ```
   //DFHAUXT  DD  DSN=CICSTS42.CICS.applid.DFHAUXT,UNIT=3400,VOL=SER=volid,
   //           DISP=(NEW,KEEP),LABEL=(,NL)
   //DFHBUXT  DD  DSN=CICSTS42.CICS.applid.DFHBUXT,UNIT=3400,VOL=SER=volid,
   //           DISP=(NEW,KEEP),LABEL=(,NL)
   ```

Sample job to allocate auxiliary trace data sets

If you are defining auxiliary trace data sets on disk, you can use this sample job to allocate and catalog them before you run CICS.

Procedure

1. The DCB subparameters shown in this sample job specify the required DCB attributes for the CICS auxiliary trace data sets. As an alternative to this job, you can specify (NEW,CATLG) on the DD statements in the CICS startup job stream, omit the DCB parameter, and let CICS open the data sets with the same default values.
2. Change the space allocations in this sample job stream to suit your installation's needs.

Example

```
//DEFTRCDS JOB (accounting information),
//            MSGCLASS=A,MSGLEVEL=(1,1),
//            CLASS=A,NOTIFY=userid
//*********************************************************************
//*           Create auxiliary trace data sets
//*********************************************************************
//ALLOCDS  EXEC PGM=IEFBR14
//DFHAUXT  DD  DSN=CICSTS42.CICS.applid.DFHAUXT,UNIT=3380,VOL=SER=volid,
//        DISP=(NEW,CATLG),DCB=(BLKSIZE=4096,RECFM=F,LRECL=4096),  1
//             SPACE=(CYL,(25))                                   2
//DFHBUXT  DD  DSN=CICSTS42.CICS.applid.DFHBUXT,UNIT=3380,VOL=SER=volid,
//        DISP=(NEW,CATLG),DCB=(BLKSIZE=4096,RECFM=F,LRECL=4096),  1
//             SPACE=(CYL,(25))                                   2
//
```

Figure 13. Sample job to define auxiliary trace data sets on disk

Chapter 8. Defining dump data sets

CICS uses the dump data sets for recording dumps as a consequence of a failure that is detected when CICS is running, or upon explicit request.

About this task

You must define two types of dump data sets:

1. MVS system dump data sets, for recording system dumps that CICS requests using the MVS SDUMP macro.
2. CICS transaction dump data sets, for recording transaction dumps.

Procedure

1. For the initial installation of CICS, define a dump data set of between 5 and 10 MB. When normal operations begin, you can adjust this to suit your own installation's requirements.
2. Change the SDUMP options using the MVS **CHNGDUMP** command. You must thoroughly review your use of the **CHNGDUMP** command when setting up your CICS region.
   a. Use the MERGE function to ensure that the areas selected by CICS to dump are included in the MVS dump data set output.
   b. Use the ADD option to replace any options specified by CICS when issuing the SDUMP. This can result in partial dumps being taken to the MVS dump data set.
3. Define the CICS transaction dump data sets, as described in "Defining the transaction dump data sets" on page 78.

Results

When you start CICS for the first time, CICS uses system default values for the dump table options, and continues to use the system default values until you modify them.

CICS has a dump table facility that enables you to control dumps. The dump table lets you:

- Specify the type of dump, or dumps, you want CICS to record.
- Suppress dumping entirely.
- Specify the maximum number of dumps to be taken during a CICS run.
- Control whether CICS is to terminate as a result of a failure that results in a dump.

System dumps

CICS produces a system dump using the MVS SDUMP macro.

The MVS SDUMP dump results from CICS issuing an MVS SDUMP macro. It includes almost the entire CICS address space, that is, the MVS nucleus and other common areas, as well as the CICS private storage areas. The SDUMP dump is written to an MVS dump data set, which you can process using the interactive problem control system (IPCS), either online under TSO, or by submitting a batch job to print it. IPCS is described in the *z/OS MVS IPCS User's Guide*. For information about the IPCS **VERBEXIT** parameters that you use with the CICS IPCS dump exit, see the *CICS Operations and Utilities Guide*. For information about the SDUMP macro, and the associated MVS dump data sets, see *z/OS MVS Diagnosis: Procedures*.

The SDUMP macros issued by CICS normally contain the `QUIESCE=NO` parameter. They might not if the SDUMP is taken because of an abend in CICS SVC code or when altering MRO control blocks. This parameter allows the MVS system to remain dispatchable while the SDUMP is being taken, thus reducing the impact on the system. However if `QUIESCE=YES` is specified as an MVS system default it will override that specified by CICS. These defaults can be altered by using the **MVS CHNGDUMP** command.

Suppressing system dumps that precede ASRx abends

The MVS system dump data sets can become full with unwanted SDUMPs that precede ASRA, ASRB, and ASRD abends (after message DFHAP0001 or DFHSR0001).

If CICS storage protection is active, you can suppress the system dumps caused by errors in application programs (after message DFHSR0001), while retaining the dumps caused by errors in CICS code (after message DFHAP0001). To do this, use a **CEMT SET SYDUMPCODE** command, or an **EXEC CICS SET SYSDUMPCODE** command to suppress system dumps for system dump code SR0001. For example:

```
CEMT SET SYDUMPCODE(SR0001) ADD NOSYSDUMP
```

CICS uses dump code SR0001 if an application program was executing in user-key at the time of the program check or MVS abend. This is possible only if storage protection is active. If the program was executing in CICS-key, dump code AP0001 is used instead.

When storage protection is not active, you can suppress system dumps for system dump code AP0001. However, this suppresses dumps for errors in both application and CICS programs. The XDUREQ global user exit can be used to distinguish between AP0001 situations in application and CICS programs.

For more information about the storage protection facilities available in CICS, see "Storage protection" in the *CICS Performance Guide*.

If you want SDUMPs for one of these transaction abends but not the other, select the one you want by using either a CEMT TRDUMPCODE or an EXEC CICS TRANDUMPCODE command. This specifies, on an entry in the dump table, that SDUMPs are taken for ASRA, ASRB, or ASRD abends. For example, to add an entry to the dump table and ensure that SDUMPs are taken for ASRB abends.specify the following:

```
CEMT SET TRDUMPCODE(ASRB) ADD SYSDUMP
```

However, in this case, the SDUMPs are taken at a later point than SDUMPs usually taken for system dump code AP0001 and SR0001.

For information about the DFHAP0001 and DFHSR0001 messages, see *CICS Messages and Codes Vol 1* and "Finding where a program check occurred" in the *CICS Problem Determination Guide*.

The CICS transaction dump data sets

You can optionally specify DCB parameters for dump data sets if you want to copy the data sets to tape or disk. When CICS opens the dump data set, it issues an MVS DEVTYPE macro. This macro returns the track size for direct access devices, or 32760 for magnetic tape.

The maximum block size used for a transaction dump is the lesser of the values returned from the DEVTYPE macro and 4096. As this usually results in a block size of 4096 (because devices generally have a track size greater than this), CICS writes multiple blocks per track. After writing each block, MVS returns the amount of space remaining on the current track. If the space remaining is 256 bytes or more, then the size of the next block written is the lesser of the values returned by MVS and 4096.

If the space remaining is less than 256 bytes, the next block is written to the next track.

There are four global user exits that you can use with the transaction dump data sets:

1. XDUCLSE, after the dump domain has closed a transaction dump data set
2. XDUREQ, before the dump domain takes a transaction dump
3. XDUREQC, after the dump domain takes a transaction dump
4. XDUOUT, before the dump domain writes a record to the transaction dump data set

For programming information about the global user exits, see the *CICS Customization Guide*

Printing the transaction dump data sets

With two data sets, you can print transaction dumps from one data set while CICS is running.

About this task

You can either print transaction dumps explicitly or use automatic switching.

Procedure

- To print transaction dumps explicitly:
  1. Use the command **`CEMT SET DUMP SWITCH`** to switch the data sets. CICS closes the current data set after any transaction dump being recorded has been completed, and opens the other data set.
  2. Print the completed data set using the DFHDU670 dump utility program. For information about the DFHDU670 dump utility program, see the *CICS Operations and Utilities Guide*.
- To print transaction dumps using automatic switching:
  1. Use the command **`CEMT SET DUMP AUTO`** to cause automatic switching when the current data set becomes full. This command permits **one** switch only. When a transaction dump data set is full, CICS closes the data set and issues console messages as follows:

```
DFHDU0303I applid Transaction Dump Data set dataset closed.
DFHDU0304I applid Transaction Dump Data set dataset opened.
DFHDU0305I applid Transaction Dump Data set switched to ddname.
```

2. If you specified DISP=SHR for the dump data set, you can print the completed data set with the DFHDU670 utility program and then reissue the **CEMT SET DUMP AUTO** command. This again switches data sets automatically (once only) when the current data set is full.

Defining the transaction dump data sets

You must define the data sets in the CICS startup job stream with the DD names DFHDMPA and DFHDMPB. If you define a single data set only, its DD name must be DFHDMPA.

About this task

You can either define DFHDMPA and DFHDMPB as temporary data sets for each CICS run, or allocate and catalog the data sets in advance to reuse them repeatedly.

Procedure

1. Code the **DUMPDS** system initialization parameter to specify which transaction dump data set is to be opened during CICS initialization. If you specify DUMPDS=AUTO, CICS opens, on a warm or emergency start, the data set that was not in use when CICS was last terminated. This lets you restart CICS after an abnormal termination without waiting to print the dump data set that was in use at termination.
2. Allocate the dump data sets. You can do this in one of two ways:
   - Use the sample data definition statements to allocate and catalog dump data sets on disk.
   - Use the CICS-supplied job DFHDEFDS to allocate and catalog the dump data sets.

   If you select to use the sample job, edit the statements as follows:

   a. Change the space allocations in this sample job stream to suit your own installation's needs.
   b. If you are running CICS with XRF, allocate different data sets for the alternate.
   c. If you use tape for recording dump output, use unlabeled tape. Standard-labeled tape, whether on a single tape drive or on two tape drives, stops you processing the contents of any of the volumes with the DFHDU670 utility until after the CICS step has been completed. If you want to use standard-labeled tape, make sure that all the output produced in the CICS run fits on the one or two volumes mounted.

      You cannot catalog dump data sets defined on unlabeled tapes. Your data set definitions must be in the CICS startup job stream each time CICS is run.

```
//DFHDMPA  DD  DSN=CICSTS42.CICS.applid.DFHDMPA,DISP=(NEW,CATLG),
//             UNIT=3380,VOL=SER=volid,SPACE=(CYL,(5,1))
//DFHDMPB  DD  DSN=CICSTS42.CICS.applid.DFHDMPB,DISP=(NEW,CATLG),
//             UNIT=3380,VOL=SER=volid,SPACE=(CYL,(5,1))
```

Figure 14. Sample job control statements for defining disk dump data sets

3. Optional: To copy dump data sets to tape or disk, specify DCB parameters on the DD statements when allocating and cataloging the dump data sets, as follows:
   ```
   //         DCB=(RECFM=VB,BLKSIZE=4096,LRECL=4092)
   ```
4. Include the following DD statements in the CICS startup job stream.
   - If you have cataloged the transaction dump data sets, add the following DD statement:
     ```
     //DFHDMPA  DD  DSN=CICSTS42.CICS.applid.DFHDMPA,DISP=SHR
     //DFHDMPB  DD  DSN=CICSTS42.CICS.applid.DFHDMPB,DISP=SHR
     ```
     DISP=SHR enables each data set, if held on disk, to be processed by the DFHDU670 offline utility after the switch to the other data set has taken place.
   - If you have put the transaction dump data sets on unlabeled tapes, add the following DD statement:
     ```
     //DFHDMPA  DD  DSN=CICSTS42.CICS.applid.DFHDMPA,UNIT=3400,VOL=SER=volid1,
     //         DISP=(NEW,KEEP),LABEL=(,NL)
     //DFHDMPB  DD  DSN=CICSTS42.CICS.applid.DFHDMPB,UNIT=3400,VOL=SER=volid2,
     //         DISP=(NEW,KEEP),LABEL=(,NL)
     ```

Results

CICS always attempts to open at least one transaction dump data set during initialization. If you do not include a DD statement for at least one transaction dump data set in your CICS job, initialization continues after the DFHDU0306 message is sent to the console.

When CICS opens the dump data set, it issues an MVS DEVTYPE macro. This returns the track size for direct access devices, or 32760 for magnetic tape. The maximum block size used for a transaction dump is the lesser of the values returned from the DEVTYPE macro and 4096. As this usually results in a block size of 4096 (because devices generally have a track size greater than this), CICS writes multiple blocks per track. After writing each block, MVS returns the amount of space remaining on the current track. If the space remaining is 256 bytes or more, then the size of the next block written is the lesser of the values returned by MVS and 4096.

If the space remaining is less than 256 bytes, the next block is written to the next track.

There are four global user exits that you can use with the transaction dump data sets:

1. XDUCLSE, after the dump domain has closed a transaction dump data set
2. XDUREQ, before the dump domain takes a transaction dump
3. XDUREQC, after the dump domain takes a transaction dump
4. XDUOUT, before the dump domain writes a record to the transaction dump data set

For programming information about the global user exits, see the *CICS Customization Guide*

Chapter 9. Defining user files

This chapter tells you how to define user files and how to access VSAM data sets, BDAM data sets, data tables, and coupling facility data tables.

About this task

CICS application programs process files, which, to CICS, are logical views of a physical data set or data table. For data tables, the file provides a view of the data table, which resides either in data space storage or in a coupling facility structure. Except in the case of coupling facility data tables, for which an underlying physical data set is optional, a data table is also associated with a source data set from which the table is loaded. For non-data-table files, the file provides a view of the data set.

A file is identified to CICS by a **file name** of up to eight characters, and there can be many files defined to CICS that refer to the same physical data set or data table. This has the following effect, depending on the type of object the file is defining:

- For non data table files, if more than one file refers to the same data set, each file refers to the same physical data.
- For user-maintained data tables, if more than one file refers to the same data set, each file represents a view of a unique data table.
- For CICS-maintained data tables, if more than one file refers to the same data set, only one can be defined as a CMT. The other files access data from the CMT created by the CMT file definition.
- For coupling facility data tables, if more than one file refers to the same data set, each file represents a view of a unique coupling facility data table in a CFDT pool (unless each file specifies the same tablename and poolname, in which case each they provide a separate view of the same table.

A data set, identified by a data set name (DSNAME) of up to 44 characters, is a collection of data held on disk. CICS file control processes only VSAM or BDAM data. Any data sets referred to by CICS files must be created and cataloged, so that they are known to MVS before any CICS job refers to them. Also, the data sets are usually initialized by being preloaded with at least some data before being used by CICS transactions.

You can use CICS-maintained or user-maintained data tables to improve the performance and function of CICS regions using files that refer to VSAM data sets. Data tables offer a method of constructing, maintaining, and gaining rapid access to data records contained in tables held in data space storage, above 16MB. Each data table is associated with a VSAM KSDS, known as its **source data set**. For more information about data tables, see “Defining data sets with multiple extents and volumes” on page 6.

You can use coupling facility data tables to share data across a sysplex, using the CICS file control API, subject to some restrictions, such as a 16 byte key length.

You can use RLS access mode to share VSAM data sets between CICS application-owning regions throughout a sysplex. See “VSAM record-level sharing (RLS)” on page 84 for further information.

Each of the above methods is discussed under the following topics:

- "VSAM data sets"
- "BDAM data sets" on page 87
- "Defining data sets to CICS" on page 88
- "Opening VSAM or BDAM files" on page 90
- "Closing VSAM or BDAM files" on page 91
- "CICS data tables" on page 92
- "Coupling facility data tables" on page 346.

VSAM data sets

You create a VSAM data set by running the Access Methods Services (AMS) utility program IDCAMS in a batch job, or by using the TSO DEFINE command in a TSO session.

About this task

The DEFINE command specifies to VSAM and MVS the VSAM attributes and characteristics of your data set. You can also use it to identify the catalog in which your data set is to be defined.

If required, you can load the data set with data, again using IDCAMS. You use the AMS REPRO command to copy data from an existing data set into the newly created one.

You can also load an empty VSAM data set from a CICS transaction. You do this by defining the data set to CICS (by allocating the data set to a CICS file), and then writing data to the data set, regardless of its empty state. See "Loading empty VSAM data sets" on page 83.

When you create a data set, you can define a data set name of up to 44 characters. If you choose not to define a name, VSAM assigns the name for you. This name, known as the data set name (or DSNAME), uniquely identifies the data set to your MVS system.

You can define VSAM data sets accessed by user files under CICS file control as eligible to be backed up while CICS is currently updating these data sets. For more information about backing up VSAM files open for update, see "Defining backup while open (BWO) for VSAM files" on page 8.

VSAM bases and paths

You store data in data sets, and retrieve data from data sets, using application programs that reference the data at the record level.

Depending on the type of data set, you can identify a record for retrieval by its key (a unique value in a predefined field in the record), by its relative byte address, or by its relative record number.

Access to records through these methods of primary identification is known as access through the base.

Sometimes you may need to identify and access your records by a secondary or alternate key. With VSAM, you can build one or more alternate indexes over a single base data set, so that you do not need to keep multiple copies of the same information organized in different ways for different applications. Using this method, you create an **alternate index path** (or paths), that links the alternate index (or indexes) with the base. You can then use the alternate key to access the records by specifying the path as the data set to be accessed, that is by allocating the path data set to a CICS file.

When you create a path you give it a name of up to 44 characters, in the same way as a base data set. A CICS application program does not need to know whether it is accessing your data through a path or a base; except that it may be necessary to allow for duplicate keys if the alternate index was specified to have non-unique keys.

Loading empty VSAM data sets

There are two ways you can load data into an empty VSAM data set.

An empty data set can be loaded using either of the following methods:
- Running the AMS utility program, IDCAMS
- Writing records to the data set using CICS transactions

Although VSAM imposes some restrictions during initial data set load processing, when the data set is said to be in **load mode**, these do not affect CICS transactions. For files opened in non-RLS mode, CICS file control “hides” load mode processing from your application programs. For files opened in RLS mode against an empty data set, load mode processing is hidden from CICS by VSAM, and all VSAM requests are allowed.

Using IDCAMS

If you have a large amount of data to load into a new data set, run the AMS utility program IDCAMS as a batch job, using the REPRO command to copy data from an existing data set to the empty data set.

When you have loaded the data set with IDCAMS, it can be used by CICS in the normal way.

A data set in VSAM load mode cannot have alternate indexes in the upgrade set. If you want to create and load a data set with alternate indexes, you must use AMS, or some other suitable batch program, to load the data set and invoke BLDINDEX to create the alternate indexes.

Using CICS applications

If the amount of data to be loaded is small, and there is no upgrade set, you may load an empty data set by using standard CICS file WRITE requests.

When the first write, or series of writes (mass insert), to the file is completed, CICS closes the file and leaves it closed and enabled, so that it will be reopened for normal processing when next referenced. If you attempt to read from a file in load mode, CICS returns a NOTFOUND condition.

Reuse of data sets

If you define a data set with the AMS REUSE attribute, it can also be emptied of data during a CICS run.

This allows it to be used as a work file. When the status of a file referencing the data set is CLOSED and DISABLED (or UNENABLED), you can use the SET EMPTY command, either from an application program using the EXEC CICS command-level interface, or from a master terminal using the master terminal CEMT command. This command sets an indicator in the installed file definition so that when the file is next opened, the VSAM high-used relative byte address (RBA) is set to zero, and the contents of the data set are effectively cleared.

If you define a data set to VSAM with the average and maximum record lengths equal, and define a file to CICS with fixed length records to reference that data set, the size of the records written to the data set **must** be of the defined size. For example, if a record in a data set has been read for update, you get errors when rewriting the record if, for example, you:

- Defined the record sizes to VSAM as 250 bytes, with the parameter RECORDSIZE(250 250)
- Defined the file to CICS with the parameter RECFORM=FIXED
- Loaded the data set with records that are only 200 bytes long

VSAM record-level sharing (RLS)

Record-level sharing (RLS) is an access mode for VSAM data sets supported by DFSMS 1.3 and later releases. RLS enables VSAM data to be shared, with full update capability, between many applications running in many CICS regions.

With RLS, CICS regions that share VSAM data sets can reside in one or more MVS images within an MVS parallel sysplex. This concept, in a parallel sysplex with VSAM RLS supporting a CICSplex, is illustrated in Figure 15 on page 85.

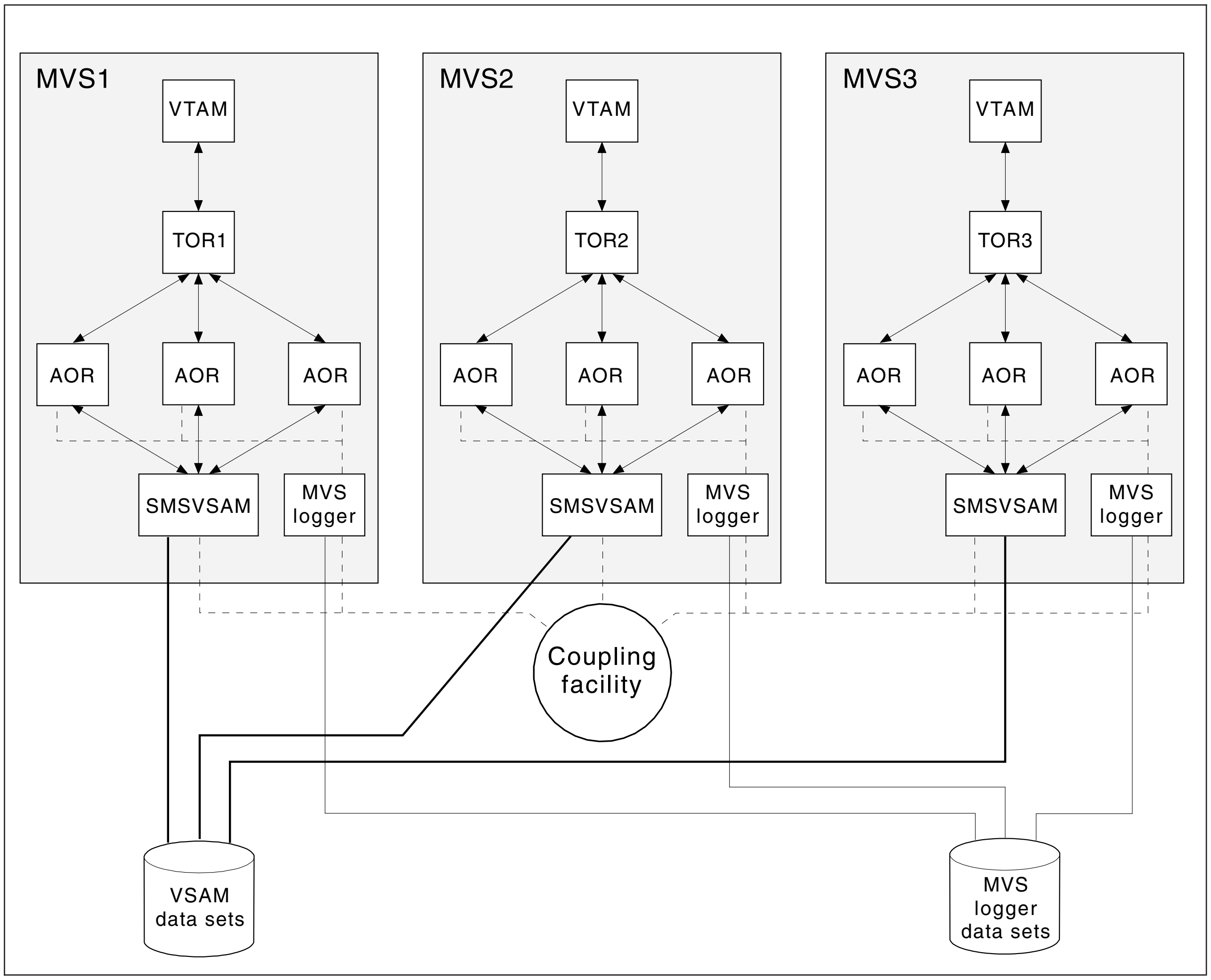


Figure 15. Diagram illustrating a Parallel Sysplex with RLS. This view of RLS shows multiple CICS regions using VSAM RLS, through the services of a SMSVSAM server in each MVS image.

Without RLS support (RLS=NO system initialization parameter), more than one CICS region cannot open the same VSAM data set concurrently using a non-RLS mode (such as LSR or NSR). These access modes mean that to share VSAM data between CICS regions, you must either:

- Use shared data tables,

  or

- Allocate the VSAM data sets to one CICS region, a file-owning region (FOR), and function ship file requests from the applications to the FOR using either MRO, APPC, or IPIC connections.

With RLS support, multiple CICS regions can open the same data set concurrently. To use RLS:

- You need a level of DFSMS that supports RLS, and RLS=YES specified as a CICS system initialization parameter
- The CICS regions must all run in the same parallel sysplex
- There must be one SMSVSAM server started in each MVS image
- Specify RLSACCESS(YES) in the CICS file resource definition to provide full update capability for data sets accessed by multiple CICS regions.

You can specify RLS access for all files supported by CICS file control, except for the following:

- Key range data sets are not supported.
- VSAM clusters defined with the IMBED attribute are not supported. However, you can remove the IMBED attribute from the cluster definition without loss of function. Use the access method services REPRO function to move the data into a new cluster defined without the IMBED attribute. You can then use RLS access mode for files that reference the new cluster. (IMBED is a performance option that is generally unnecessary with modern caching disk controllers.)
- Opening individual components of a VSAM cluster (which is not supported by CICS for any mode of access).
- Temporary data sets are not supported.
- Key-sequence data sets (KSDS) in relative byte address (RBA) mode (OPTCDE=ADR) are not supported. Application programs that specify the RBA keyword on file control API commands for a KSDS opened RLS mode receive an INVREQ with RESP2 51 exception condition.
- Direct open of alternate index (AIX) data is not supported in RLS access mode. However, path access to data is supported.
- VSAM catalogs and VVDS data sets are not supported.

Although you can specify RLS access for entry-sequenced data sets (ESDS), it is not recommended, because it can have a negative effect on the performance and availability of the data set when you are adding records. For more information, see VSAM and file control: improving performance in the Performance Guide.

For details of all the steps necessary to set up support for VSAM RLS, see Setting up VSAM RLS support in the *CICS Installation Guide*.

Mixed-mode operation for VSAM data sets

Generally, you choose which data sets need to be shared and updated in RLS mode by multiple CICS regions. When you have made this choice, you are recommended always to update these data sets in RLS mode.

However, with RLS support, data sets can be shared in mixed access mode, between CICS regions and batch jobs. Mixed access mode means that a data set is open in RLS mode and a non-RLS mode concurrently by different users.

Although data sets can be open in different modes at different times, all the data sets within a VSAM sphere normally should be opened in the same mode. (A sphere is the collection of all the components—the base, index, any alternate indexes and alternate index paths—associated with a given VSAM base data set.) However, VSAM does permit mixed-mode operations on a sphere by different applications, subject to some CICS restrictions. In the following discussion about mixed-mode operation, references to a data set refer to any component of the sphere.

SMSVSAM operation of mixed mode:

SMSVSAM permits a data set to be opened in different modes concurrently, by different applications in a sysplex.

There are some sharing rules and limitations:

- A data set that is open in RLS mode to a number of CICS regions can also be opened in non-RLS mode for **read-only** operations

- Read-integrity is not guaranteed for the non-RLS application
- A data set to be opened concurrently in RLS and non-RLS mode must be defined with cross-region SHAREOPTIONS(2)

CICS restrictions:

You can open a file in RLS mode or non-RLS mode in a CICS region when the referenced data set is already open in a different mode by another user (CICS region or batch job).

However, in addition to the above VSAM rules, a data set cannot be open in different modes concurrently within the same CICS region. This ensures that CICS maintains a consistent view of data within the CICS region.

The CICS restrictions operate as follows:

- If a data set is opened in RLS mode in a CICS region, it cannot be opened, through another file, in non-RLS mode in the same CICS region.

  A non-RLS mode file open request fails with message DFHFC0512 if CICS already has the data set open in RLS mode.
- If a data set is opened in non-RLS mode in a CICS region, it cannot be opened, through another file, in RLS mode in the same CICS region.

  An RLS mode file open request fails with message DFHFC0511 if CICS already has the data set open in non-RLS mode.
- If a CICS region has unresolved recovery work for a data set it cannot be opened, through another file, in non-RLS mode in the same CICS region.

  A non-RLS mode file open request fails with message DFHFC0513 if CICS has outstanding recovery work for the data set.

BDAM data sets

CICS supports access to keyed and nonkeyed BDAM data sets. To construct and format such data sets, you use BDAM.

About this task

A BDAM data set must contain data before it is used in a CICS run. You load the data set using a batch program that writes the records sequentially. An example of this is Figure 16.

Notes:

```
//BDAM EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSIN    DD DUMMY
//SYSPRINT DD SYSOUT=A
//SYSUT1   DD DSN=CICSTS42.bdam.user.file.init,DISP=SHR         1
//SYSUT2   DD DSN=CICSTS42.bdam.user.file,DISP=(,CATLG),        2
//         SPACE=(TRK,(1,1)),UNIT=3380,VOL=SER=volid,
//         DCB=(RECFM=F,LRECL=80,BLKSIZE=80,DSORG=DA)           3
```

Figure 16. Sample JCL to create and load a BDAM data set

1. The input data set (called SYSUT1 in this example) should be physically sequential and have attributes that are compatible with the DCB for the output data set (called SYSUT2 in this example; see note 3). In particular:

   - If RECFM=F is specified for the output data set, then the input data set must have RECFM=F or RECFM=FB specified, and the value of LRECL should be the same for both data sets.
   - If RECFM=V or RECFM=U is specified for the output data set, then the value of LRECL for the input data set must not be greater than that specified on the output data set.
2. When you create a data set, you define a data set name (DSNAME) of up to 44 characters. This data set name uniquely identifies the data set to your MVS system.
3. The DCB parameter for the output data set should specify the following:
   - DSORG=DA. This identifies the data set as a BDAM data set.
   - BLKSIZE. This should have the same value as specified for BLKSIZE in the associated file control table (FCT) entry.
   - RECFM. This can take the values F (fixed), V (variable), or U (undefined), and correspond to the first subparameter of the RECFORM operand in the associated FCT entry.

These options are specified on the DFHFCT TYPE=FILE definition. The *CICS Resource Definition Guide* gives information about defining files using DFHFCT TYPE=FILE options. A data set created by this example, and loaded with data such as that shown in Figure 17, would have the following attributes specified in its FCT entry:

- BLKSIZE=80
- LRECL=40
- RECFORM=(FIXED BLOCKED)
- KEYLEN=8

```
RECORD 1 DATA FOR RECORD 1     RECORD 2 DATA FOR RECORD 2
RECORD 3 DATA FOR RECORD 3     RECORD 4 DATA FOR RECORD 4

RECORD98 DATA FOR RECORD 98    RECORD99 DATA FOR RECORD 99
1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

Figure 17. Sample data for loading a BDAM data set

Defining data sets to CICS

Before CICS can open a file referencing a data set, there must be an installed file definition for that file. The definition can be installed either from the CSD or from a file control table (FCT).

You can define VSAM files **only** through the CSD, and BDAM files **only** through the FCT. Definitions other than for BDAM in the FCT will not be installed, but they may remain in the FCT.

A file is identified by its file name, which you specify when you define the file. CICS uses this name when an application program, or the master terminal operator using the CEMT command, refers to the associated data set.

Each file must also be associated with its data set in one of the following ways:

- Using JCL in the startup job stream
- Using the DSNAME and DISP parameters of the FILE resource definitions
- Using dynamic allocation with CEMT

- Using dynamic allocation with an application program

The number of VSAM files that can be allocated to a CICS address space is about 10000. However, VSAM maintains a table entry for each file opened, and table space limits the number of files opened to about 8189.

Using JCL

You can define the data set in a DD statement in the JCL of the CICS startup job. The DD name must be the same as the file name that refers to the data set.

For example, the following DD statements would correspond to file definitions for the file names VSAM1A and BDAMFILE:

```
//VSAM1A    DD   DSN=CICSTS42.CICS.vsam.user.file,DISP=OLD
//BDAMFILE  DD   DSN=CICSTS42.CICS.bdam.user.file,DISP=SHR
```

If you define a data set to CICS in this way it is allocated to CICS by MVS at CICS startup time, and it normally remains allocated until the end of the CICS run. Also, the physical data set is associated with the installed file definition throughout the CICS run.

If you use JCL to define a user data set to the CICS system, the DD statement must not include the FREE=CLOSE operand.

If you use the RLS=CR or RLS=NRI option on your DD statement, it will be ignored. The access mode for the file (RLS or non-RLS) and any read integrity options must be specified in the file definition.

Using the DSNAME and DISP file resource definition parameters

You can define a data set to CICS by specifying the **DSNAME** and **DISP** parameters when you define the file.

You can specify these parameters either using RDO for files, or by using DFHFCT macros (BDAM files only). If you want to use DSNAME and DISP from the file definition, do **not** provide a DD statement for the data set in the startup job stream, because the attributes in the DD statement will override those in the CICS resource definition.

If you use DSNAME and DISP on the file definition, CICS allocates the data set dynamically at the time the first file referencing that data set is opened; that is, immediately before the file is opened. At this stage, CICS associates the file name with the data set.

When CICS applications subsequently refer to the data set, they do so by specifying the file name. When you define a data set in this way, it is automatically deallocated by CICS when the file is closed.

For information about using the **DSNAME** and **DISP** parameters, see the *CICS Resource Definition Guide*

Dynamic allocation using CEMT

You can set the data set name dynamically in an installed file definition by using the master terminal CEMT command.

```
CEMT SET FILE(filename) DSNAME(datasetname) SHARE|OLD
```

When you use this command, CICS allocates the data set as part of OPEN processing as described above. The data set is automatically deallocated when the last file entry associated with the data set is closed. Before you can dynamically allocate a file using the CEMT command, the file status must be CLOSED, and also be DISABLED or UNENABLED.

This method of defining the data set to CICS allows a file definition to be associated with different data sets at different times. Alternatively, you can close the file and deallocate the data set and then reallocate and open the same file with a different DISP setting. For example, you could do this to enable the physical data set to be shared with a batch program, which reads the data set.

For information about the CEMT SET command, see *CICS Supplied Transactions*.

Other forms of dynamic allocation

You are recommended to use only those methods of dynamic allocation that are part of CICS file control, and are described in the previous sections.

Do **not** use the CICS dynamic allocation transaction, ADYN, which invokes the sample CICS utility program, DFH99, for dynamic allocation of VSAM and BDAM **user files**. Use of the ADYN transaction may conflict with the dynamic allocation methods used within CICS file control, and can give unpredictable results.

Restrict the use of the ADYN transaction to those data sets not managed by CICS file control, such as auxiliary trace and CICS transaction dump data sets.

For information about the CICS samples, see the CICS/ESA 4.1 Sample Applications Guide

Opening VSAM or BDAM files

Before your application programs can access a file, CICS must first have opened the file using the installed file definition referenced by your program.

About this task

Part of the process of opening a file is to ensure that the control blocks and buffers required for subsequent processing of the data set are available. If you defined the file to use VSAM local shared resources (LSR), these control blocks and buffers are allocated from the pool of resources. If the LSR pool does not exist at the time of the opening, CICS calculates the requirements and builds the pool before the file is opened. If you defined the file to use nonshared resources, the required control blocks and buffers are allocated by VSAM as part of OPEN processing. If you defined the file to be opened in RLS access mode, VSAM allocates control blocks and buffers in the SMSVSAM address space and associated data set. RLS mode also uses a CF cache structure, to which the data set is bound when the first file that references it is opened.

You may need to access a single VSAM data set either through the base or through one or more paths for different access requests. In this case, CICS uses a separate file definition (that is, a separate file), for each of the access routes. Each file definition must be associated with the corresponding data set name (a path is also assigned a data set name). Each file must be open before CICS can access the file using the attributes in its installed file definition. This is because opening **one** file for a data set that is logically defined as two or more files with different attributes does not mean that the data set is then available for all access routes.

CICS permits more than one file definition to be associated with the same physical data set name. For example, you may want to define files with different processing attributes that refer to the same data set.

CICS allows or denies access to data in a file, depending on whether the state of the file is ENABLED. An **enabled** file that is closed is opened by CICS automatically when the first access request is made. The file remains open until an explicit CLOSE request or until the end of the CICS job.

You can also open a file explicitly by using either of the commands

```
CEMT SET FILE(filename) OPEN
EXEC CICS SET FILE(filename) OPEN
```

When you use one of these commands, the file is opened irrespective of whether its state is enabled or disabled. You may choose this method to avoid the overhead associated with opening the file being borne by the first transaction to access the file.

You can also specify that you want CICS to open a file immediately after initialization by specifying the RDO OPENTIME(STARTUP) attribute (or the FILSTAT=OPENED parameter in the DFHFCT macro). If you specify that you want CICS to open the file after startup, and if the file status is ENABLED or DISABLED, the CICS file utility transaction CSFU opens the file. (CSFU does not open files that are: defined as UNENABLED the status of these remains CLOSED, UNENABLED.) CSFU is initiated automatically, immediately before the completion of CICS initialization. CICS opens each file with a separate OPEN request. If a user transaction starts while CSFU is still running, it can reference and open a file that CSFU has not yet opened; it does not have to wait for CSFU to finish.

Closing VSAM or BDAM files

You can close files with a CLOSE command, with or without the FORCE option.

About this task

Closing files normally

You can close a file explicitly using the **`SET FILE(filename) CLOSED`** command.

The file is closed immediately if there are no transactions using the file at the time of the request. The file is also disabled as part of the close operation, this form of disablement showing as UNENABLED on a CEMT display. This prevents subsequent requests to access the file implicitly reopening it.

A transaction in the process of executing a VSAM or BDAM request, or executing a series of connected requests, is said to be a user of the file. For example, a transaction is a user during the execution of the following requests:

```
READ UPDATE ---- REWRITE
STARTBROWSE ---- READNEXT ... ---- ENDBROWSE
```

A transaction is also a user of a file if it completes a recoverable change to the file but has not yet reached a sync point or the end of the transaction.

If there are users at the time of the close request, the file is not closed immediately. CICS waits for all current users to complete their use of the file. The file is placed in an UNENABLING state to deny access to new users but allow existing users to complete their use of the file. When the last user has finished with the file, the file is closed and UNENABLED. If a transaction has made recoverable changes to a file and then suffered a failure during syncpoint, the unit of work is shunted, and the file can be closed at this point.

Closing files using the FORCE option

You can close a file using the FORCE option on the `SET FILE(filename)` command.

Any transactions that are current users of the file are abended and allowed to back out any changes as necessary, and the file is then closed and UNENABLED. A file UNENABLED as a result of a CLOSE request can be reenabled subsequently if an explicit OPEN request is made.

Closing a file using the FORCE option causes tasks of any current users of the file to be terminated immediately by the CICS task FORCEPURGE mechanism. Data integrity is not guaranteed with this mechanism. In some extreme cases (for example, if an error occurs during backout processing), CICS might terminate abnormally. For this reason, closing files using the FORCE option should be restricted to exceptional circumstances.

CICS data tables

You can define a data table by using the `CEDA DEFINE FILE` command.

About this task

When a table is opened, CICS builds it by extracting data from the tables corresponding source VSAM data set and loading it into an MVS data space owned by the CICS data tables server region, and constructing an index in CICS virtual storage above the 16 MB line. The commands used to access these tables are the file control commands of the CICS application programming interface (API).

For information about defining CICS data tables, see the *CICS Resource Definition Guide*. For programming information about the file control commands of the application programming interface, see the the *CICS Application Programming Reference*. CICS supports two types of data table:

- **CICS-maintained data tables** that CICS keeps in synchronization with their source data sets.
- **User-maintained data tables** that are detached from their source data sets after being loaded.

For either type, a global user exit can be used to select which records from the source data set should be included in the data table.

For programming interface information about global user exits, see the *CICS Customization Guide*. For further information about CICS data tables, see the *CICS Shared Data Tables Guide*.

Opening data tables

A data table must be opened before its entries can be accessed by an application.

You can open a data table explicitly with an OPEN request, implicitly on first reference, or by the CSFU task just after startup, if OPENTIME(STARTUP) was specified in the file definition. When a data table is opened, CICS reads the complete source data set, copying the records into a data space and building an index.

A global user exit can be invoked for each record copied into the data table. This copying is subject to any selection criteria of the user-written exit.

The commands used to open data tables, and the rules and options concerning their implicit and immediate opening are the same as those described in “Opening VSAM or BDAM files” on page 90.

Loading data tables

A data table is built automatically when it is opened.

An index is constructed to provide rapid access to the records. See the *CICS Shared Data Tables Guide* for more details.

For a user-maintained data table, the ACB for the source data set is closed when loading has been completed. The data set is deallocated if it was originally dynamically allocated and there are no other ACBs open for it.

Closing data tables

You can close a data table with a CLOSE command, with or without the FORCE option.

When a data table is closed, the data space storage that was used to hold the records and the address space storage used for the associated index, is freed as part of the CLOSE operation.

The commands used to close data tables, and the rules concerning current users of a data table are the same as those described in “Closing VSAM or BDAM files” on page 91.

Chapter 10. Defining the CDBM GROUP command data set

The CDBM GROUP command data set, DFHDBFK, is a VSAM key-sequenced data set (KSDS). The CDBM transaction uses this data set to provide a repository for stored groups of DBCTL commands, .

About this task

Procedure

1. Create the DFHDBFK data set by running an IDCAMS job, an example of which is shown in Figure 18 on page 96.

```
//DBFKJOB  JOB  'accounting information',name,MSGCLASS=A
//*
//DBFKDEF  EXEC PGM=IDCAMS,REGION=1M
//SYSPRINT DD SYSOUT=*
//AMSDUMP  DD SYSOUT=*
//SYSIN    DD *
  DELETE CICSTS42.CICS.DFHDBFK
  SET MAXCC=0
  DEFINE CLUSTER (                          -
              NAME( CICSTS42.CICS.DFHDBFK )  -
              INDEXED                        -
              RECORDS(100 20)                -
              KEYS(22,0)                     -
              RECORDSIZE(1428 1428)          -
              )                              -
  INDEX       (                              -
              NAME( CICSTS42.CICS.DFHDBFK.INDEX )     -
              CONTROLINTERVALSIZE(512)       -
              )                              -
  DATA        (                              -
              NAME( CICSTS42.CICS.DFHDBFK.DATA )      -
              CONTROLINTERVALSIZE(2048)      -
              )
/*
//*     The next two job steps are optional.
//*
//DBFKINID EXEC PGM=IDCAMS,REGION=1M
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
 DELETE  CICSTS42.CICS.DBFKINIT
/*
//DBFKINIF EXEC PGM=IEBGENER
//SYSPRINT DD   SYSOUT=A
//SYSUT2   DD   DSN=CICSTS42.CICS.DBFKINIT,DISP=(NEW,CATLG),
// UNIT=dbfkunit,VOL=SER=dbfkvol,SPACE=(TRK,(1,1)),
// DCB=(RECFM=FB,LRECL=40,BLKSIZE=6160)
//*  Place the definitions you want to load after SYSUT1. For example:
//SYSUT1   DD *
SAMPLE      DIS       DB DI21PART
SAMPLE      STA       DB DI21PART
SAMPLE      STO       DB DI21PART
/*
//SYSIN    DD *
 GENERATE MAXFLDS=1
 RECORD FIELD=(40)
/*
//DBFKLOAD EXEC PGM=IDCAMS,REGION=1M
//SYSPRINT DD SYSOUT=*
//AMSDUMP  DD SYSOUT=*
//SYS01    DD DSN=CICSTS42.CICS.DBFKINIT,DISP=SHR
//DFHDBFK  DD DSN=CICSTS42.CICS.DFHDBKF,DISP=SHR
//SYSIN    DD *
  REPRO INFILE (SYS01)                  -
        OUTFILE (DFHDBFK)
/*
//
```

where *dbfkvol* is the volume on which the DFHDBFK data set is to be created and *dbfkunit* is the unit type for that volume.

Figure 18. Sample job to define and initialize the DFHDBFK data set

2. Use this job to load IMS™ commands or use the maintenance function within the CDBM transaction.

Job control statements for CICS execution

About this task

If you define the DFHDBFK data set using the sample JCL shown in Figure 18 on page 96, the data definition statement for the CICS execution is as follows:

```
//DFHDBFK  DD DSN=CICSTS42.CICS.DFHDBFK,DISP=SHR
```

Alternatively, if you want to use dynamic file allocation, add the fully-qualified data set name to the DFHDBFK file resource definition.

Record layout in the CDBM GROUP command file

Each record in the DFHDBFK file may be up to 1428 characters long, as follows:

About this task

field	length	content	description
1	12	Group	a 12-character field containing your chosen name for this group. The acceptable characters are A-Z 0-9 $ @ and #. Leading or embedded blanks are not allowed, but trailing blanks are acceptable.
2	10	IMS Command	a 10-character field containing any of the IMS command verbs that are valid for CDBM (see the *Connection, disconnection, and inquiry transactions for the CICS DBCTL interface* topic in the *CICS IMS Database Control Guide* for details). Leading or embedded blanks are not allowed, but trailing blanks are acceptable. **Note:** The validity of the IMS command verb is not checked by CDBM. Invalid values will be reported by IMS when the command is attempted.
3	1406	IMS Command parameters	Up to 1406 characters of parameters appropriate to the chosen IMS command verb. (This will often consist of lists of databases.) **Note:** Wildcard characters may not be used in the parameters stored in the CDBM Group command file. This is unlike the other functions of the CDBM transaction which permit the use of wildcard characters to describe multiple similarly named databases.

Chapter 11. Defining the CMAC messages data set

The CMAC messages data set is a VSAM key-sequenced data set (KSDS) called DFHCMACD. The CMAC transaction uses DFHCMACD to provide online descriptions of the CICS messages and codes.

About this task

Procedure

1. Create the DFHCMACD data set and load it with the CICS-supplied messages and codes data. You can create the data set in one of the following ways:
   - Run the DFHCMACI job. For more information about the DFHCMACI, see the *CICS Transaction Server for z/OS Installation Guide*.
   - Use the supplied sample job, as described in "Job control statements to define and load the messages data set."
2. If you use the supplied sample job to define the messages data set, add the following data definition statement to your CICS start up JCL:
   ```
   //DFHCMACD  DD DSN=CICSTS42.CICS.DFHCMACD,DISP=SHR
   ```
3. The DFHCMACD data set is accessed by the file CMAC, which is managed by CICS file control. You must create a CICS resource definition for this file. The CICS-supplied definition for the CMAC file and other resources required by the CICS messages facility are in the CSD group DFHCMAC. The CICS IVPs have a DD statement for the CMAC file, but for dynamic allocation you must copy the supplied resource definition for the CMAC file and add the DSNAME option.
4. To use the CICS messages facility in your CICS region, you must create your own CSD group list to include the CICS-supplied group list DFHLIST, the DFHCMAC group for the CICS messages facility, and any other groups of resources that your CICS region needs. You must specify this group list by using the system initialization parameter **GRPLIST** when you start up your CICS region.

Job control statements to define and load the messages data set

Before its first use, the DFHCMACD data set should be defined and loaded as a VSAM key sequenced data set (KSDS). The following sample job shows you how to do this.

About this task

Note that `cmacvol` is the volume on which the DFHCMACD data set is to be created.

```
//CMACJOB  JOB  'accounting information',name,MSGCLASS=A
//CMACDEF  EXEC PGM=IDCAMS,REGION=1M
//SYSPRINT DD SYSOUT=*
//AMSDUMP  DD SYSOUT=*
//SYSIN    DD *
  DELETE CICSTS42.CICS.DFHCMACD
  SET MAXCC=0
  DEFINE CLUSTER (                         -
              NAME( CICSTS42.CICS.DFHCMACD )      -
              CYL(2,1)                     -
              KEYS( 9 0 )                  -
              INDEXED                      -
              VOLUME ( cmacvol)            -
              RECORDSIZE( 8192 30646 )     -
              FREESPACE( 5 5 )             -
              SHAREOPTIONS( 2 )            -
              )                            -
  INDEX       (                            -
              NAME( CICSTS42.CICS.DFHCMACD.INDEX )    -
              )                            -
  DATA        (                            -
              NAME( CICSTS42.CICS.DFHCMACD.DATA )     -
              )
/*
//CMACLOAD EXEC PGM=IDCAMS,REGION=1M
//SYSPRINT DD SYSOUT=*
//AMSDUMP  DD SYSOUT=*
//SYS01    DD DSN=CICSTS42.CICS.SDFHMSGS(DFHCMACD),DISP=SHR
//DFHCMACD DD DSN=CICSTS42.CICS.DFHCMACD,DISP=SHR
//SYSIN    DD *
  REPRO INFILE (SYS01)                 -
        OUTFILE (DFHCMACD)
/*
//
```

Figure 19. Sample job to define and initialize the CMAC data set

Chapter 12. Defining the EJB data sets

This chapter describes the VSAM key-sequenced data sets you need for CICS EJB support.

These data sets are:
- The EJB directory, DFHEJDIR
- The EJB object store, DFHEJOS

These data sets, and the IDCAMS definition statements for creating them, are described in the following topic.

Defining EJB directory and object store data sets

DFHEJDIR is a file containing a request streams directory that is shared by all the regions (listeners and AORs) in a logical EJB server. DFHEJOS is a file of passivated stateful session beans. It is shared by all the AORs in the logical EJB server.

The EJB directory and object store data sets are CICS file-control-managed data sets that require resource definitions in the CSD. Because the data sets must be shared by all the CICS regions that form a logical EJB server, you can define each of them to CICS file control using one of the following formats:

- An ordinary VSAM data set, to be opened in either LSR or NSR mode (that is, with the LSRPOOLNUM attribute specified with a pool number, or as NONE). In this case, the data set must be owned by one CICS region (a file-owning region) to which the others in the EJB server can function ship file requests.

  Definitions for both data sets are supplied in the CICS CSD group called DFHEJVS, with the LSRPOOLNUM default value of 1. Make a copy of this CSD group, rename it, and edit the file definitions to add details such as the data set name for dynamic allocation, or a specific LSRPOOLNUM to match an explicit LSRPOOL resource definition.
- A VSAM data set to be opened in RLS mode. Definitions for both data sets are supplied in the CICS CSD group called DFHEJVR with RLSACCESS(YES) specified. Make a copy of this CSD group, rename it, and edit the file definitions to add attributes such as the data set name for dynamic allocation.
- A coupling facility data table. Definitions for both data sets are supplied in the CICS CSD group called DFHEJCF. Make a copy of this CSD group, rename it, and edit the file definitions to modify the CFDT details, such as the pool name and the table name.

Figure 20 on page 102 shows an example of the JCL you can use to define an EJB directory data set.

```
//EJBDIR   JOB accounting info,,CLASS=A
//DEFEJB   EXEC PGM=IDCAMS
//SYSPRINT DD   SYSOUT=*
//SYSIN    DD   *
//*
//* DEFINE A DIRECTORY
//* DATASET
//*
  DEFINE CLUSTER(NAME(CICSTS42.CICS.DFHEJDIR)-
          INDEXED-
          LOG(UNDO)-                            1
          CYL(2 1)-
          VOLUME(volid)-                        2
          RECORDSIZE( 1017 1017 )-              3
          KEYS( 16 0 )-
          FREESPACE ( 10 10 )-
          SHAREOPTIONS( 2 3 ))-
        DATA  (NAME(CICSTS42.CICS.DFHEJDIR.DATA) -
          CONTROLINTERVALSIZE(1024)) -
        INDEX (NAME(CICSTS42.CICS.DFHEJDIR.INDEX))
/*
//*
```

Figure 20. Example JCL to define an EJB directory data set

1. The backout recovery attribute is defined in the ICF catalog so that the data set defined by this job can be used in either RLS or non-RLS mode. For data sets used in RLS mode, the recovery attributes must be defined in the ICF catalog, and they override any that are specified in the CICS file resource definition. The EJB directory data set must be defined as recoverable.
2. Specify your own value for the VOLUME parameter, or remove it altogether if you are using SMS-managed storage.
3. The average and maximum record size must both be defined as 1017 bytes.

Note: You should not need to change any of the definition values shown in Figure 20. DFHEJDIR contains only one record, its control record. However, ensure that runtime settings are specified (such as BUFND, BUFNI, and STRNO subparameters on the AMP parameter on the DD statement, or the equivalent in the CICS file resource definition) to support the maximum number of requests that could be active at any one time.

Figure 21 on page 103 shows an example of the JCL you can use to define an EJB object store.

```
//EJBOS    JOB accounting info,,CLASS=A
//DEFEJB   EXEC PGM=IDCAMS
//SYSPRINT DD   SYSOUT=*
//SYSIN    DD   *
//*
//* DEFINE AN OBJECT STORE
//* DATASET
//*
  DEFINE CLUSTER(NAME(CICSTS42.CICS.DFHEJOS) -
         INDEXED -
         LOG(NONE) -                        1
         RECORDS(1000,100) -                2
         VOLUME(volid) -                    3
         RECORDSIZE( 8185 8185 ) -          4
         KEYS( 16 0 ) -
         FREESPACE ( 10 10 ) -
         SHAREOPTIONS( 2 3 )) -
       DATA  (NAME(CICSTS42.CICS.DFHEJOS.DATA) -
         CONTROLINTERVALSIZE(8192)) -
       INDEX (NAME(CICSTS42.CICS.DFHEJOS.INDEX))
/*
//*
```

Figure 21. Example JCL to define an EJB object store data set

1. The backout recovery attribute is defined in the ICF catalog so that the data set defined by this job can be used in either RLS or non-RLS mode. For data sets used in RLS mode, the recovery attributes must be defined in the ICF catalog, and they override any that are specified in the CICS file resource definition. The EJB object store data set must be defined as unrecoverable.
2. The number of records that the file can hold. VSAM automatically calculates space requirements.
3. Specify your own value for the VOLUME parameter, or remove it altogether if you are using SMS-managed storage.
4. The average and maximum record size are both shown as 8185 bytes in this sample job, but you must calculate your own size as described in “Determining the object store space requirements.”

Determining the object store space requirements

Follow these guidelines when calculating the size of your object store data set:

1. Find the average size of a stateful bean. To do this you can write a method that serializes a bean and writes it to a file. The filesize is the size of the bean. Repeat for each bean, and then calculate the average filesize.

   Note: The size of the bean depends on what state the bean has. For example, if a stateful bean contains a hashtable populated with 100 KB of non-transient data then the serialized object must also contain this information.
2. Round the figure at Step 1 up to nearest multiple of 512-bytes (subject to a minimum of 1024-bytes).
3. Estimate the maximum number of records, and use this as the primary allocation in the RECORDS parameter (see 2).
4. Estimate the requirements for the secondary allocation, for example by halving the primary allocation.

   Modify the supplied IDCAMS step in DFHDEFDS to create an object store that meets your needs.

Chapter 13. Defining the WS-AT data set

The data set you require to enable CICS Web Services Atomic Transaction (WS-AT) support is the WS-AT directory data set, DFHPIDIR. The WS-AT directory data set, DFHPIDIR, is a file containing a mapping between contexts and tasks.

The WS-AT directory and object store data set, DFHPIDIR, is a CICS file-control-managed data set that requires a resource definition in the CSD. Because the data set is shared across CICS regions that together provide a WS-AT capable Web service provider, you can define it to CICS file control as one of the following formats:

- An ordinary VSAM data set, to be opened in either LSR or NSR mode; that is, with the LSRPOOLNUM attribute specified with a pool number, or as NONE. In this case, the data set has to be owned by one CICS region (a file-owning region) to which the other regions can function ship file requests.

  A definition for the data set is supplied in the CICS CSD group DFHPIVS, with the LSRPOOLNUM default value of 1. Make a copy of this CSD group, rename it, and edit the file definitions to add details such as the data set name for dynamic allocation, a specific LSRPOOLNUM to match an explicit LSRPOOL resource definition, or the remote system attributes.
- A VSAM data set to be opened in RLS mode. A definition for the data set is supplied in the CICS CSD group DFHPIVR with RLSACCESS(YES) specified. Make a copy of this CSD group, rename it, and edit the file definitions to add attributes such as the data set name for dynamic allocation.
- A coupling facility data table. A definition for the data set is supplied in the CICS CSD group DFHPICF. Make a copy of this CSD group, rename it, and edit the file definitions to modify the CFDT details, such as the pool name and the table name.

Figure 22 shows the statements used to define DFHPIDIR.

```
 DEFINE CLUSTER(NAME(@dsindex@.CICS@regname@.DFHPIDIR)-
  INDEXED-
  LOG(UNDO)-                                1
  CYL(2 1)-
  VOLUME(@dsvol@)-                          2
  RECORDSIZE( 1017 1017 )-                  3
  KEYS( 16 0 )-
  FREESPACE ( 10 10 )-
  SHAREOPTIONS( 2 3 ))-
DATA  (NAME(@dsindex@.CICS@regname@.DFHPIDIR.DATA) -
  CONTROLINTERVALSIZE(1024)) -
INDEX (NAME(@dsindex@.CICS@regname@.DFHPIDIR.INDEX))
```

Figure 22. Example JCL to define the WS-AT directory data set

1. Define the backout recovery attribute in the ICF catalog, so that the data set defined by this job can be used in either RLS or non-RLS mode. For data sets used in RLS mode, you define the recovery attributes in the ICF catalog, and those attributes override any that are specified in the CICS file resource definition. You must define the PI directory data set as recoverable.

2. Specify your own value for the VOLUME parameter, or remove it completely if you are using SMS-managed storage.

3. The default record size is 1 KB, which can be changed.

Note: You do not change any of the definition values shown in Figure 22 on page 105. DFHPIDIR contains only one record, its control record. However, ensure that you specify runtime settings (such as BUFND, BUFNI, and STRNO subparameters on the AMP parameter on the DD statement, or the equivalent in the CICS file resource definition) to support the maximum number of requests that might be active at any one time.

Chapter 14. Setting up the debugging profiles data sets

Application programmers who use certain debugging tools with CICS create debugging profiles which are stored in a VSAM key sequenced data set with an alternative index.

To set up the debugging profiles data sets:

1. Use the IDCAMS utility to create and initialize the VSAM data sets.
2. Create file definitions for the data sets. The data sets can be shared by more than one CICS region, and can be defined as:

   VSAM RLS files

   Define VSAM RLS files when you want to share profiles between several CICS regions in the same sysplex

   VSAM non-RLS files

   Define VSAM non-RLS files when you do not need to share profiles between regions in the same sysplex

   Remote files

   Define remote files when you want to use profiles that are stored in a region that is connected using MRO or ISC.

Creating the debugging profiles data sets

You can create the debugging profiles data sets in one of two ways. You can either use an IDCAMS utility to create and initialize the data sets or you can run the CICS-supplied job, DFHDEFDS, to create the data sets for a CICS region

Use the IDCAMS utility to create and initialize the following VSAM data sets:

DFHDPFMB

The debugging profiles base data set.

DFHDPFMP

The debugging profiles path data set.

DFHDPFMX

The debugging profiles alternate index data set.

Use the JCL in Figure 23 on page 108.

```
//DPFM  JOB  'accounting information',name,MSGCLASS=A
//DEFINE EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN  DD  *
    DELETE CICSTS42.CICS.DFHDPFMB

    DEFINE CLUSTER (RECORDS(1000)-
     NAME (CICSTS42.CICS.DFHDPFMB) -
     SHAREOPTIONS(2 3) -
     LOG(NONE) -
     VOLUME (&DSVOL)  -
     IXD)            -
    DATA -
     (RECSZ(2560,2560) -
     CONTROLINTERVALSIZE(3072) -
     NAME (CICSTS42.CICS.DFHDPFMB.DATA) -
     KEYS(17 1) -
     FREESPACE(10 10) -
     BUFFERSPACE (8192)) -
   INDEX -
     (NAME(CICSTS42.CICS.DFHDPFMB.INDX))
//INITDP EXEC PGM=IDCAMS,REGION=512K
//SYSPRINT DD SYSOUT=A
//SYSIN    DD *
     REPRO INFILE ( SYS01 ) -
           OUTDATASET(CICSTS42.CICS.DFHDPFMB)
//SYS01     DD *
 DDUMMY   RECORD                      !! DO NOT ALTER !!
 EEXAMPLE RECORD   REMOVE THIS LINE IF SAMPLES NOT REQUIRED
/*
//DEFALT   EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN  DD  *
    DEFINE ALTERNATEINDEX -
     ( NAME(CICSTS42.CICS.DFHDPFMX ) -
     RECORDS(1000) -
     VOLUME(&DSVOL) -
     KEYS(12 20) -
     RELATE(CICSTS42.CICS.DFHDPFMB) -
     RECORDSIZE(200 200) -
     SHAREOPTIONS(2 3) -
     UPGRADE ) -
    DATA -
     ( NAME(CICSTS42.CICS.DFHDPFMX.DATA) ) -
    INDEX -
     ( NAME(CICSTS42.CICS.DFHDPFMX.INDEX) )
    DEFINE PATH -
     ( NAME(CICSTS42.CICS.DFHDPFMP) -
     PATHENTRY(CICSTS42.CICS.DFHDPFMX) )
/*
//BLDDP EXEC PGM=IDCAMS
//BDSET1 DD DSN=CICSTS42.CICS.DFHDPFMB,DISP=SHR
//ADSET1 DD DSN=CICSTS42.CICS.DFHDPFMX,DISP=SHR
//SYSPRINT DD SYSOUT=A
//SYSIN    DD *
     BLDINDEX -
            INFILE(BDSET1) -
            OUTFILE(ADSET1)
/*
//*
```

Figure 23. Sample JCL to create the debugging profiles data sets

The sample JCL creates data sets which contain example debugging profiles. To create empty data sets, remove the following line:

```
 EEXAMPLE RECORD   REMOVE THIS LINE IF SAMPLES NOT REQUIRED
```

Defining the debugging profiles data sets as VSAM RLS files

Define VSAM RLS files when you want to share profiles between several CICS regions in the same sysplex.

CICS provides the following sample definitions:

```
*-----------------------------------------------------------------*
*    Define base file for Debugging Profiles (RLS)                *
*-----------------------------------------------------------------*
DEFINE FILE(DFHDPFMB) GROUP(DFHDPVR)
DESCRIPTION(Debugging Profiles base file - VSAM RLS)
        RLSACCESS(YES)            TABLE(NO)
        LSRPOOLNUM(1)             DSNSHARING(ALLREQS)
        STRINGS(5)                STATUS(ENABLED)
        OPENTIME(FIRSTREF)        DISPOSITION(SHARE)
        DATABUFFERS(3)            INDEXBUFFERS(2)
        RECORDFORMAT(V)           READINTEG(REPEATABLE)
        ADD(YES)                  BROWSE(NO)
        DELETE(YES)               READ(YES)
        UPDATE(YES)               JOURNAL(NO)
        JNLREAD(NONE)             JNLSYNCREAD(NO)
        JNLUPDATE(NO)             JNLADD(NONE)
        JNLSYNCWRITE(YES)         RECOVERY(NONE)
        FWDRECOVLOG(NO)           BACKUPTYPE(STATIC)
*-----------------------------------------------------------------*
*    Define path file for Debugging Profiles (RLS)                *
*-----------------------------------------------------------------*
DEFINE FILE(DFHDPFMP) GROUP(DFHDPVR)
DESCRIPTION(Debugging Profiles path file - VSAM RLS)
        RLSACCESS(YES)            TABLE(NO)
        LSRPOOLNUM(1)             DSNSHARING(ALLREQS)
        STRINGS(10)               STATUS(ENABLED)
        OPENTIME(FIRSTREF)        DISPOSITION(SHARE)
        DATABUFFERS(11)           INDEXBUFFERS(10)
        RECORDFORMAT(V)           READINTEG(REPEATABLE)
        ADD(YES)                  BROWSE(NO)
        DELETE(YES)               READ(YES)
        UPDATE(YES)               JOURNAL(NO)
        JNLREAD(NONE)             JNLSYNCREAD(NO)
        JNLUPDATE(NO)             JNLADD(NONE)
        JNLSYNCWRITE(YES)         RECOVERY(NONE)
        FWDRECOVLOG(NO)           BACKUPTYPE(STATIC)
```

Figure 24. Resource definitions for debugging profiles data sets defined as VSAM RLS files

1. Copy the sample FILE definitions for DFHDPFMB and DFHDPFMP resource to another group.
2. Add the DSNAME attribute:
   - For DFHDPFMB, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMB
     ```
   - For DFHDPFMP, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMP
     ```

   Alternatively, you can omit the DSNAME attribute, and include a DD card in the CICS startup JCL. For example:
   ```
   //DFHDPFMB DD DSN=CICSTS42.CICS.DFHDPFMB,DISP=SHR
   //DFHDPFMP DD DSN=CICSTS42.CICS.DFHDPFMP,DISP=SHR
   ```
3. Install the FILE definitions.

Defining the debugging profiles data sets as VSAM non-RLS files

Define VSAM non-RLS files when you do not need to share profiles between regions in the same sysplex.

CICS provides the following sample definitions:

```
*-------------------------------------------------------------------*
*    Define base file for Debugging Profiles (non-RLS)              *
*-------------------------------------------------------------------*
 DEFINE FILE(DFHDPFMB) GROUP(DFHDPVSL)
 DESCRIPTION(Debugging Profiles Base File)
         RLSACCESS(NO)              LSRPOOLNUM(1)
         READINTEG(UNCOMMITTED)     DSNSHARING(ALLREQS)
         STRINGS(10)                STATUS(ENABLED)
         OPENTIME(FIRSTREF)         DISPOSITION(SHARE)
         DATABUFFERS(11)            INDEXBUFFERS(10)
         TABLE(NO)                  RECORDFORMAT(V)
         ADD(YES)                   BROWSE(YES)
         DELETE(YES)                READ(YES)
         UPDATE(YES)                JOURNAL(NO)
         JNLREAD(NONE)              JNLSYNCREAD(NO)
         JNLUPDATE(NO)              JNLADD(NONE)
         JNLSYNCWRITE(NO)           RECOVERY(NONE)
         FWDRECOVLOG(NO)            BACKUPTYPE(STATIC)
*-------------------------------------------------------------------*
*    Define path file for Debugging Profiles (non-RLS)              *
*-------------------------------------------------------------------*
 DEFINE FILE(DFHDPFMP) GROUP(DFHDPVSL)
 DESCRIPTION(Debugging Profiles Path File)
         RLSACCESS(NO)              LSRPOOLNUM(1)
         READINTEG(UNCOMMITTED)     DSNSHARING(ALLREQS)
         STRINGS(10)                STATUS(ENABLED)
         OPENTIME(FIRSTREF)         DISPOSITION(SHARE)
         DATABUFFERS(11)            INDEXBUFFERS(10)
         TABLE(NO)                  RECORDFORMAT(V)
         ADD(YES)                   BROWSE(YES)
         DELETE(YES)                READ(YES)
         UPDATE(YES)                JOURNAL(NO)
         JNLREAD(NONE)              JNLSYNCREAD(NO)
         JNLUPDATE(NO)              JNLADD(NONE)
         JNLSYNCWRITE(NO)           RECOVERY(NONE)
         FWDRECOVLOG(NO)            BACKUPTYPE(STATIC)
```

Figure 25. Resource definitions for debugging profiles data sets defined as VSAM non-RLS files

1. Copy the sample FILE definitions for DFHDPFMB and DFHDPFMP resource to another group.
2. Add the DSNAME attribute:
   - For DFHDPFMB, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMB
     ```
   - For DFHDPFMP, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMP
     ```

   Alternatively, you can omit the DSNAME attribute, and include a DD card in the CICS startup JCL. For example:
   ```
   //DFHDPFMB DD DSN=CICSTS42.CICS.DFHDPFMB,DISP=SHR
   //DFHDPFMP DD DSN=CICSTS42.CICS.DFHDPFMP,DISP=SHR
   ```
3. Install the FILE definitions.

Defining the debugging profiles data sets as remote files

Define remote files when you want to use profiles that are stored in a region that is connected using MRO or ISC.

CICS provides the following sample definitions:

```
*-----------------------------------------------------------------*
*    Define base file for Debugging Profiles (non-RLS remote)      *
*-----------------------------------------------------------------*
DEFINE FILE(DFHDPFMB) GROUP(DFHDPVSR)
DESCRIPTION(Debugging Profile Base File - VSAM Remote)
        REMOTESYSTEM(CICA)        REMOTENAME(DFHDPFMB)
*-----------------------------------------------------------------*
*    Define path file for Debugging Profiles (non-RLS remote)      *
*-----------------------------------------------------------------*
DEFINE FILE(DFHDPFMP) GROUP(DFHDPVSR)
DESCRIPTION(Debugging Profile Path File - VSAM Remote)
        REMOTESYSTEM(CICA)        REMOTENAME(DFHDPFMP)
```

Figure 26. Resource definitions for debugging profiles data sets defined as remote files

1. Copy the sample FILE definitions for DFHDPFMB and DFHDPFMP resource to another group.
2. Add the DSNAME attribute:
   - For DFHDPFMB, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMB
     ```
   - For DFHDPFMP, specify the name of the debugging profiles base data set. For example:
     ```
     DSNAME ==> CICSTS42.CICS.DFHDPFMP
     ```

   Alternatively, you can omit the DSNAME attribute, and include a DD card in the CICS startup JCL. For example:
   ```
   //DFHDPFMB DD DSN=CICSTS42.CICS.DFHDPFMB,DISP=SHR
   //DFHDPFMP DD DSN=CICSTS42.CICS.DFHDPFMP,DISP=SHR
   ```
3. Install the FILE definitions.

If you define remote files, you will need to install corresponding file definitions in the remote system.

Part 2. CICS system initialization

This section of the book describes how to define CICS system initialization parameters and how they are processed by CICS. It also describes a startup job stream you can use to start a CICS system.

- Chapter 15, "Specifying CICS system initialization parameters," on page 115 describes the CICS system initialization parameters.
- Chapter 16, "Processing system initialization parameters," on page 289 describes the use of the PARM parameter, the SYSIN data set, and the system console for supplying system initialization parameters, and how these are processed by CICS.
- Chapter 18, "CICS startup," on page 305 describes a sample startup job stream, and a sample procedure for use as a started task.

Chapter 15. Specifying CICS system initialization parameters

You can use the CICS system initialization parameters to modify CICS system attributes when you start your CICS regions. Different methods are available to define the parameters to CICS. Each system initialization parameter is described, including the syntax and a detailed description.

The information defined by system initialization parameters can be grouped into three categories:

1. Information used to initialize and control CICS system functions (for example, information such as the dynamic storage area limits and the region exit time interval)
2. Module suffixes used to load your own versions of CICS control tables (for example, DFHMCTxx)
3. Special information used to control the initialization process

The primary method of providing system initialization parameters is with a system initialization table (SIT). The parameters of the SIT, which you assemble as a load table, supply the system initialization program with most of the information necessary to initialize the system to suit your unique environment. You can generate more than one SIT, and at the time of system initialization select the one that is appropriate to your needs.

You can also specify other system initialization parameters, which cannot be coded in the SIT. You can specify which SIT you want, and other system initialization parameters (with a few exceptions), in any of three ways:

1. In the PARM parameter of the EXEC PGM=DFHSIP statement
2. In the SYSIN data set defined in the startup job stream
3. Through the system operator's console

You can also use these methods of input to the system initialization process to override most of the system initialization parameters assembled in the SIT.

There are some system initialization parameters that cannot be coded in the SIT; other parameters cannot be specified in any other way. Finally, some system initialization parameters cannot be specified through the system operator's console. For more information, see:

- System initialization parameters that cannot be defined with the DFHSIT macro
- System initialization parameters that can be defined only with the DFHSIT macro
- System initialization parameters that cannot be defined through the system operator's console

When you upgrade to a new CICS release

When you upgrade to a new CICS release, if you have existing system initialization tables, you must modify them. Remove all obsolete parameters, and specify the required values for new or changed parameters if you want to run with other than the defaults. When you have made the necessary changes, reassemble the tables using the CICS Transaction Server for z/OS, Version 4 Release 2 macro libraries.

If you have system initialization parameters defined in CICS startup procedures, you must modify these also.

To avoid generating specific system initialization tables for each CICS region, a simple solution is to let CICS load the default, unsuffixed table (DFHSIT) at startup, and supply the system initialization parameters for each region in a SYSIN data set. For more information about the source of the default system initialization table, see The default system initialization table.

This chapter describes:
- "Specifying DFHSIT macro parameters"
- "The default system initialization table" on page 278
- "The system initialization parameter descriptions and summary" on page 118
- "Assembling the SIT" on page 285
- "Selecting versions of CICS programs and tables" on page 285

Specifying DFHSIT macro parameters

You can specify most system initialization parameters in a DFHSIT macro.

About this task

Procedure

1. Code the following macro parameter first:

   TYPE={CSECT|DSECT}
   This parameter specifies the type of SIT to be generated.
   CSECT
   A regular control section that is normally used.
   DSECT
   A dummy control section.

   For example:
   ```
   DFHSIT TYPE=CSECT,      *
   ```
2. Use the following syntax to add system initialization parameters to the macro:

   ```
            ┌─TYPE=CSECT─┐
   ►►──DFHSIT─┼────────────┼──┬─────────────────────┬──────────────────────►◄
            └─TYPE=DSECT─┘  └─parameter──=──value─┘
   ```

   where *parameter* is the system initialization parameter that you want to code, and *value* is the appropriate parameter value. You should code the parameters and keywords in uppercase, except for parameters where case is important. For example, any parameter that specifies the name of a z/OS UNIX directory is case sensitive. The system initialization parameters are described in detail in "The system initialization parameter descriptions and summary" on page 118.
3. Terminate your macro parameters with the following statement:
   ```
   END DFHSITBA
   ```

Example

Defining CICS resource table and module keywords

About this task

The following table shows the system initialization keywords for those CICS resources that:
- Have a suffix option, or
- Result in a dummy program or table if you code resource=NO, or
- You can COLD start individually

Table 9. Summary of resources with a suffix, a dummy load module, or a COLD option

DFHSIT keyword 1	**Default 2**	**Suffix 3**	**Dummy 4**	**COLD start 5**
BMS	FULL	-	-	COLD
CLT	-	xx	-	-
DIP	NO	-	program	-
FCT	YES	xx	-	-
ICP	-	-	-	COLD
MCT	NO	xx	6	-
PDIR	NO	xx	-	-
PLTPI	NO	xx	-	-
PLTSD	NO	xx	-	-
RST	NO	xx	-	-
SRT	YES	xx	-	-
TCT	YES	xx	table	-
TS	-	-	-	COLD
TST	NO	xx	-	-
XLT	NO	xx	-	-

Note:
1. When the DFHSIT keyword is specified with more than one value, these values must be enclosed within parentheses: for example, BMS=(FULL,COLD).
2. The **Default** column indicates the default value for the keyword in the DFHSIT macro.

   For keywords with the suffix option, if you code YES in the SIT, an unsuffixed version of the table or program is loaded. For example, TCT=YES results in a table called DFHTCT being loaded. You can also select an unsuffixed module or table at CICS startup by specifying ***keyword=,*** or ***keyword=YES***. For example, if you code:

   ```
   FCT=, or FCT=YES
   ```

   blanks are appended to DFHFCT, and these unsuffixed names are used during initialization.

   The result of specifying ***keyword=,*** as a system initialization parameter through PARM, SYSIN, or CONSOLE is not necessarily the same as in the DFHSIT macro. For example, TST=, (or omitted altogether) when coding the DFHSIT macro is taken to mean TST=NO, but TST=, through any of the other three methods is the same as TST=YES.

3. The **Suffix** column indicates whether you can code a suffix. (xx indicates that a suffix can be coded.)

   A suffix can be any 1 or 2 characters, but you must not use DY, and you cannot use NO as a suffix.

   If you code a suffix, a table or program with that suffix appended to the standard name is loaded.
4. The **Dummy** column indicates whether a dummy version of the program or table is loaded if you code NO. In some cases, coding NO for the operand associated with the **table** results in a dummy **program**. For more information about the effect of this option, see "Selecting versions of CICS programs and tables" on page 285.
5. The **COLD start** column indicates whether the resource can be forced to start COLD. (COLD indicates that the resource can be cold started individually.) TST and cold start ensure that you cold start temporary storage or the whole system if you make any change to the TST.

   If COLD is coded, it can be overridden only by coding START=(...,ALL) as a system initialization parameter. For more information about this option, see page ALL.

   For more information about CICS table and program selection, see "Selecting versions of CICS programs and tables" on page 285.
6. If you code MCT=NO, the CICS monitoring domain builds dynamically a default monitoring control table. This ensures that default monitoring control table entries are always available for use when monitoring is on and a monitoring class is active.

The system initialization parameter descriptions and summary

There are a number of ways that system initialization parameters can be defined to CICS.

You can define system initialization parameters in any of the following ways:
1. In a DFHSIT macro
2. In a PARM parameter on the EXEC PGM=DFHSIP statement
3. In the SYSIN data set of the CICS startup job stream
4. Through the system console. For parameters that require mixed case values, type / on an SDSF command line to open the System Command Extension facility. Use single quotes around the parameter and value that you want to specify to preserve the mixed case. The command is still echoed in uppercase in the job log, but SDSF processes the value in mixed case.

Default values are **underscored**; for example, ADI=**30**. This notation applies to the SIT macro parameters only.

The table lists the parameters and default values, along with whether the parameter is specified in a DFHSIT macro, in a PARM parameter, in the SYSIN data set, or through the system console.

Table 10. System initialization parameters with override options and default settings

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
ADI	YES	YES	YES	YES	30	XRF(B) - Alternate delay interval

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
AIBRIDGE	YES	YES	YES	YES	AUTO	Bridge Autoinstall URM
AICONS	YES	YES	YES	YES	NO	No autoinstall for MVS CONSOLES
AIEXIT	YES	YES	YES	YES	DFHZATDX	Autoinstall user program name
AILDELAY	YES	YES	YES	YES	0	Delete delay period for AI terminals
AIQMAX	YES	YES	YES	YES	100	Maximum number of terminals queued for AI
AIRDELAY	YES	YES	YES	YES	700	Restart delay period for AI terminals
AKPFREQ	YES	YES	YES	YES	4000	Activity keypoint frequency
APPLID	YES	YES	YES	YES	DBDCCICS	z/OS Communications Server APPL identifier
AUTCONN	YES	YES	YES	YES	0	Autoconnect delay
AUTODST	YES	YES	YES	YES	NO	Language Environment® automatic storage tuning
AUTORESETTIME	YES	YES	YES	YES	NO	Time-of-day synchronization
AUXTR	YES	YES	YES	YES	OFF	Auxiliary trace option
AUXTRSW	YES	YES	YES	YES	NO	Auxiliary trace autoswitch facility
BMS	YES	YES	YES	YES	FULL, UNALIGN, DDS	Basic Mapping Support options
BRMAXKEEPTIME	YES	YES	YES	YES	86400	Bridge Max Keeptime
CDSASZE	YES	YES	YES	NO	0	The size of CDSA
CHKSTRM	YES	YES	YES	NO	NONE	Activation of terminal storage-violation checking
CHKSTSK	YES	YES	YES	NO	NONE	Activation of task storage-violation checking
CICSSVC	YES	YES	YES	YES	216	The CICS SVC number
CILOCK	YES	YES	YES	YES	NO	Do not keep CI lock after read update
CLSDSTP	YES	YES	YES	YES	NOTIFY	Notification for ISSUE PASS command
CLT	YES	YES	YES	YES	No default	The command list table option or suffix
CMDPROT	YES	YES	YES	YES	YES	Exec storage command checking
CMDSEC	YES	YES	NO	YES	ASIS	API command security checking
CONFDATA	YES	YES	NO	YES	SHOW	Show confidential data in dump and trace

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
CONFTXT	YES	YES	NO	YES	NO	Do not prevent z/OS Communications Server tracing user data
CPSMCONN	YES	YES	YES	YES	NO	Do not connect to CPSM
CRLPROFILE	YES	YES	YES	YES	No default	Name of profile that allows CICS to access certificate revocation lists
CSDACC	YES	YES	YES	YES	READWRITE	CSD access
CSDBKUP	YES	YES	YES	YES	STATIC	Backup type of CSD (STATIC or DYNAMIC)
CSDBUFND	YES	YES	YES	YES	No default	Number of data buffers for the CSD
CSDBUFNI	YES	YES	YES	YES	No default	Number of index buffers for the CSD
CSDDISP	YES	YES	YES	YES	No default	CSD disposition for dynamic allocation
CSDDSN	YES	YES	YES	YES	No default	CSD data set name for dynamic allocation
CSDFRLOG	YES	YES	YES	YES	NO	Journal ID for CSD forward recovery
CSDINTEG	YES	YES	YES	YES	UNCOMMITTED	Read integrity = uncommitted
CSDJID	YES	YES	YES	YES	NO	Journal ID for CSD auto journaling
CSDLSRNO	YES	YES	YES	YES	1	The VSAM LSR pool number for the CSD
CSDRECOV	YES	YES	YES	YES	NONE	CSD recoverable file option
CSDRLS	YES	YES	YES	YES	NO	Use traditional VSAM
CSDSTRNO	YES	YES	YES	YES	6	CSD number of strings
CWAKEY	YES	YES	YES	YES	USER	CWA storage key
DAE	YES	YES	YES	YES	NO	SDUMPS will not be suppressed by DAE
DATFORM	YES	YES	YES	YES	MMDDYY	CSA date format
DB2CONN	YES	YES	YES	YES	NO	Do not connect to DB2 at CICS startup
DBCTLCON	YES	YES	YES	YES	NO	Do not connect to DBCTL at CICS start
DEBUGTOOL	YES	YES	YES	YES	NO	No Debugging Tool access
DFLTUSER	YES	YES	NO	YES	CICSUSER	Default user
DIP	YES	YES	YES	YES	NO	Batch data interchange program
DISMACP	YES	YES	YES	YES	YES	Disable macro programs
DOCCODEPAGE	YES	YES	YES	YES	037	Default host code page
DSALIM	YES	YES	YES	YES	5M	Upper limit of DSA below 16 MB line

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
DSHIPIDL	YES	YES	YES	YES	020000	Delete shipped idle time
DSHIPINT	YES	YES	YES	YES	120000	Delete shipped interval
DSRTPGM	YES	YES	YES	YES	NONE	Distributed routing program
DTRPGM	YES	YES	YES	YES	DFHDYP	Dynamic routing program
DTRTRAN	YES	YES	YES	YES	CRTX	Default dynamic transaction routing transid
DUMP	YES	YES	YES	YES	YES	Dump option
DUMPDS	YES	YES	YES	YES	AUTO	CICS dump data set opening option
DUMPSW	YES	YES	YES	YES	NO	Dump data set autoswitch option
DURETRY	YES	YES	YES	YES	30	SDUMP total retry time (in seconds)
ECDSASZE	YES	YES	YES	NO	0	Size of the ECDSA
EDSALIM	YES	YES	YES	YES	48M	Upper limit of DSA above 16 MB line
EJBROLEPRFX	YES	YES	YES	YES	No default	EJB ROLE PREFIX
ENCRYPTION	YES	YES	YES	YES	STRONG	Level of encryption for SSL
EODI	YES	YES	YES	YES	E0	End-of-data indicator for sequential devices
ERDSASZE	YES	YES	YES	NO	0	Size of the ERDSA
ESDSASZE	YES	YES	YES	NO	0	Size of the ESDSA
ESMEXITS	NO	NO	NO	YES	NOINSTLN	External security manager exits
EUDSASZE	YES	YES	YES	NO	0	Size of the EUDSA
FCT	YES	YES	YES	YES	NO	File control table option or suffix
FCQRONLY	YES	YES	YES	YES	YES	Threadsafe FC runs on QR TCB
FEPI	YES	YES	YES	YES	NO	Front-End Programming Interface
FLDSEP	YES	YES	YES	YES	' ' (four blanks)	End-of-field separator characters
FLDSTRT	YES	YES	YES	YES	' ' (one blank)	Field start character for built-in function
FORCEQR	YES	YES	YES	YES	NO	Do not force QR for threadsafe programs
FSSTAFF	YES	YES	YES	YES	NO	Function-shipped START affinity option
FTIMEOUT	YES	YES	YES	YES	30	File timeout 30 seconds
GMTEXT	YES	YES	YES	YES	'WELCOME TO CICS'	Good-morning message text
GMTRAN	YES	YES	YES	YES	CSGM	Initial transaction

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
GNTRAN	YES	YES	YES	YES	NO	Signoff transaction
GRNAME	YES	YES	YES	YES	No default	Generic resource name for CICS TORs
GRPLIST	YES	YES	YES	YES	DFHLIST	List name of CSD groups for startup
GTFTR	YES	YES	YES	YES	OFF	GTF trace option
HPO	NO	NO	NO	YES	NO	z/OS Communications Server High Performance Option (HPO)
ICP	YES	YES	YES	YES	COLD	Interval control program start option
ICV	YES	YES	YES	YES	1000	Region exit interval (milliseconds)
ICVR	YES	YES	YES	YES	5000	Runaway task interval (milliseconds)
ICVTSD	YES	YES	YES	YES	500	Terminal scan delay interval (")
IIOPLISTENER	YES	YES	YES	YES	YES	Whether the CICS region is to function as an IIOP listener region
INFOCENTER	YES	YES	YES	YES	No default	The server name of where the CICS Information Center is installed and the port number that it uses to run in server mode
INITPARM	YES	YES	YES	YES	No default	Initialization parameters for programs
INTTR	YES	YES	YES	YES	ON	CICS internal trace option
IRCSTRT	YES	YES	YES	YES	NO	Interregion communication start
ISC	YES	YES	YES	YES	NO	Intersystem communication option
JESDI	YES	YES	YES	YES	30	JES delay interval for XRF alternate
JVMCCSIZE	YES	YES	YES	YES	24M	Shared Class Cache size
JVMCCSTART	YES	YES	YES	YES	AUTO	Start Shared Class Cache when needed
JVMxxxxTRACE	YES	YES	YES	NO	No default	JVM trace, specifies level of trace required
JVMPROFILEDIR	YES	YES	YES	YES	/usr/lpp/cicsts /cicsts42/JVMProfiles	JVM profile directory
KEYRING	YES	YES	YES	YES	No default	Key ring to be used by SSL support
LGDFINT	YES	YES	YES	YES	5	Log defer interval in Log Manager

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
LGNMSG	YES	YES	YES	YES	NO	Extract z/OS Communications Server logon data
LLACOPY	YES	YES	YES	YES	YES	Use MVS LLACOPY support
LOCALCCSID	YES	YES	YES	YES	037	The default CCSID for the local region
LPA	YES	YES	YES	YES	NO	Use-LPA option for CICS/user modules
MAXJVMTCBS	YES	YES	YES	YES	5	Maximum number of JVM open TCBs
MAXOPENTCBS	YES	YES	YES	YES	12	Maximum number of open TCBs
MAXSOCKETS	YES	YES	YES	YES	65535	Maximum number of IP sockets
MAXSSLTCBS	YES	YES	YES	YES	8	Limit on number of SSL TCBs
MAXXPTCBS	YES	YES	YES	YES	5	Limit on number of XP TCBs
MCT	YES	YES	YES	YES	NO	Monitoring control table option or suffix
MN	YES	YES	YES	YES	OFF	CICS monitoring option
MNCONV	YES	YES	YES	YES	NO	Monitoring converse recording option
MNEXC	YES	YES	YES	YES	OFF	Monitoring exception class option
MNFREQ	YES	YES	YES	YES	0	Monitoring frequency period
MNIDN	YES	YES	YES	YES	OFF	Monitoring identity class option
MNPER	YES	YES	YES	YES	OFF	Monitoring performance class option
MNRES	YES	YES	YES	YES	OFF	Monitoring resource class option
MNSYNC	YES	YES	YES	YES	NO	Monitoring syncpoint recording option
MNTIME	YES	YES	YES	YES	GMT	Monitoring timestamp (GMT or LOCAL)
MQCONN	YES	YES	YES	YES	NO	Do not connect to MQ at startup
MROBTCH	YES	YES	YES	YES	1	Number of MRO requests to batch
MROFSE	YES	YES	YES	YES	NO	Extend lifetime of long-running mirror
MROLRM	YES	YES	YES	YES	NO	Long-running mirror task option

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
MSGCASE	YES	YES	YES	YES	MIXED	CICS messages in mixed case
MSGLVL	YES	YES	YES	YES	1	System console MSG level option
MXT	YES	YES	YES	YES	5	Maximum number of tasks in CICS
NATLANG	YES	YES	YES	YES	E	List of national languages
NCPLDFT	YES	YES	YES	YES	DFHNC001	Named counter default pool name
NEWSIT	YES	YES	YES	NO	NO	Load a specified SIT and enforce use of all system initialization parameters
NONRLSRECOV	YES	YES	YES	YES	VSAMCAT	Select location of recovery options for non-RLS files
OFFSITE	YES	YES	YES	NO	NO	Restart in off-site recovery mode
OPERTIM					120	Write to operator timeout (seconds)
OPNDLIM	YES	YES	YES	YES	10	OPNDST/CLSDST request limit
PARMERR	YES	YES	YES	YES	INTERACT	System initialization parameter errors option
PDI	YES	YES	YES	YES	30	Primary delay interval - XRF active
PDIR	YES	YES	YES	YES	NO	DL/I PSB directory option or suffix
PGAICTLG	YES	YES	YES	YES	MODIFY	PG autoinstall catalog state
PGAIEXIT	YES	YES	YES	YES	DFHPGADX	PG autoinstall exit program
PGAIPGM	YES	YES	YES	YES	INACTIVE	PG autoinstall state
PGCHAIN	YES	YES	YES	YES	No default	BMS CHAIN command
PGCOPY	YES	YES	YES	YES	No default	BMS COPY command
PGPURGE	YES	YES	YES	YES	No default	BMS PURGE command
PGRET	YES	YES	YES	YES	No default	BMS RETURN command
PLTPI	YES	YES	YES	YES	NO	Program list table PI option or suffix
PLTPISEC	YES	YES	NO	YES	NONE	No PLT security checks on PI programs
PLTPIUSR	YES	YES	NO	YES	No default	PLT PI userid = CICS region userid
PLTSD	YES	YES	YES	YES	NO	Program list table SD option or suffix
PRGDLAY	YES	YES	YES	YES	0	BMS purge delay interval
PRINT	YES	YES	YES	YES	NO	Print key option
PRTYAGE	YES	YES	YES	YES	32768	Dispatcher priority aging value

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
PRVMOD	YES	YES	YES	NO	name	Names of modules that are not to be used from the LPA
PSBCHK	YES	YES	NO	YES	NO	PSB resource checking required
PSDINT	YES	YES	YES	YES	0	Persistent session delay interval
PSTYPE	YES	YES	YES	YES	SNPS	z/OS Communications Server single node persistent Sessions
PVDELAY	YES	YES	YES	YES	30	Timeout value for LUIT table
QUIESTIM	YES	YES	YES	YES	240	Timeout value for quiesce requests
RAMAX	YES	YES	YES	YES	256	Maximum I/O area for RECEIVE ANY
RAPOOL	YES	YES	YES	YES	50	Maximum RECEIVE ANY request parm. lists
RDSASZE	YES	YES	YES	NO	0	Size of the RDSA
RENTPGM	YES	YES	YES	YES	PROTECT	Reentrant program write protection
RESP	YES	YES	YES	YES	FME	Logical unit response type
RESSEC	YES	YES	NO	YES	ASIS	Resource security check
RLS	YES	YES	YES	YES	NO	RLS option
RLSTOLSR	YES	YES	YES	YES	NO	RLS files in LSRPOOL build calculation
RMTRAN	YES	YES	YES	YES	CSGM	XRF alternate recovery transaction
RRMS	YES	YES	YES	YES	NO	Recoverable resource management services
RST	YES	YES	YES	YES	NO	Recovery service table (XRF-DBCTL)
RSTSIGNOFF	YES	YES	YES	YES	NOFORCE	XRF - Re-sign on after takeover
RSTSIGNTIME	YES	YES	YES	YES	500	XRF - sign off timeout value
RUWAPOOL	YES	YES	YES	YES	NO	Allocating storage pool for Language Environment
SDSASZE	YES	YES	YES	NO	0	Size of the SDSA
SDTRAN	YES	YES	YES	YES	CESD	Shutdown transaction
SEC	YES	YES	NO	YES	YES	External security manager option
SECPRFX	YES	YES	NO	YES	NO	Security prefix

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
SIT	YES	YES	YES	NO	No default	Suffix of the system initialization table that you want loading at the start of system initialization
SKRxxxx	YES	YES	YES	YES	No default	Single keystroke retrieval operation required
SNSCOPE	YES	YES	NO	YES	NONE	Multiple CICS sessions per user ID
SPCTR	YES	YES	YES	YES	(1,2)	Levels of special tracing required for CICS as a whole
SPCTRxx	YES	YES	YES	NO	(1,2)	The level of special tracing for a particular CICS component used by a transaction, terminal, or both
SPOOL	YES	YES	YES	YES	NO	System spooling interface option
SRBSVC	YES	YES	YES	YES	215	HPO Type 6 SVC number
SRT	YES	YES	YES	YES	1$	System recovery table option or suffix
SRVERCP	YES	YES	YES	YES	037	Default server code page to be used by the DFHCNV data conversion table (if the SRVERCP parameter in the DFHCNV macro is set to SYSDEF)
SSLCACHE	YES	YES	YES	YES	CICS	SSL session ID caching
SSLDELAY	YES	YES	YES	YES	600	SSL timeout value
START	YES	YES	YES	YES	AUTO	CICS system initialization option
STARTER	NO	NO	NO	YES	YES	Starter ($ and #) suffixes option **Note:** The default is NO but the parameter must be set to YES here to enable the SIT to assemble correctly.
STATEOD	YES	YES	YES	YES	0	Statistics end-of-day time
STATINT	YES	YES	YES	YES	030000	Statistics interval time
STATRCD	YES	YES	YES	YES	OFF	Statistics recording status
STGPROT	YES	YES	YES	YES	NO	Storage protection facility
STGRCVY	YES	YES	YES	YES	NO	Storage recovery option
STNTR	YES	YES	YES	YES	1	Level of standard tracing required for CICS as a whole

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
STNTRxx	YES	YES	YES	NO	1	Level of standard tracing you require for a particular CICS component
SUBTSKS	YES	YES	YES	YES	0	Number of concurrent mode TCBs
SUFFIX	NO	NO	NO	YES	$$	Suffix of this SIT
SYDUMAX	YES	YES	YES	YES	999	Number of SYSDUMPS to be taken
SYSIDNT	YES	YES	YES	YES	CICS	Local system identifier
SYSTR	YES	YES	YES	YES	ON	Master system trace flag
TAKEOVR	YES	YES	YES	YES	MANUAL	XRF alternate takeover option
TBEXITS	YES	YES	YES	YES	No default	Backout exit programs
TCP	YES	YES	YES	YES	YES	Terminal control program option or suffix
TCPIP	YES	YES	YES	YES	NO	TCP/IP support
TCSACTN	YES	YES	YES	YES	NONE	TC Shutdown action
TCSWAIT	YES	YES	YES	YES	4	TC Shutdown wait
TCT	YES	YES	YES	YES	NO	Terminal control table option or suffix
TCTUAKEY	YES	YES	YES	YES	USER	TCT user area storage key
TCTUALOC	YES	YES	YES	YES	BELOW	TCT user area below 16MB
TD	YES	YES	YES	YES	(3,3)	Transient data buffers and strings
TDINTRA	YES	YES	YES	YES	NOEMPTY	Initial state of transient data queues
TDSUBTASK	YES	YES	YES	YES	OFF	No TD subtasking
TRANISO	YES	YES	YES	YES	NO	Transaction Isolation
TRAP	YES	YES	YES	YES	OFF	F.E. global trap exit option
TRDUMAX	YES	YES	YES	YES	999	Number of TRANDUMPS to be taken
TRTABSZ	YES	YES	YES	YES	4096	Internal trace table size in 1K bytes
TRTRANSZ	YES	YES	YES	YES	16	Transaction dump trace table size
TRTRANTY	YES	YES	YES	YES	TRAN	Transaction dump trace option
TS	YES	YES	YES	YES	(3,3)	Temporary storage buffers and strings
| TSMAINLIMIT	YES	YES	YES	YES	64M	Upper limit of storage for TS main queues
TST	YES	YES	YES	YES	NO	Temporary storage table option or suffix
UDSASZE	YES	YES	YES	NO	0	Size of the UDSA

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
UOWNETQL	YES	YES	YES	YES	No default	Qualifier for NETUOWID
USERTR	YES	YES	YES	YES	ON	Master user trace flag
USRDELAY	YES	YES	YES	YES	30	Timeout value for user directory entries
USSHOME	YES	YES	YES	YES	/usr/lpp/ cicsts/ cicsts42	The name and path of the root directory for CICS files on z/OS UNIX
VTAM	YES	YES	YES	YES	YES	z/OS Communications Server access method option
VTPREFIX	YES	YES	YES	YES	\	Client virtual terminal prefix
WEBDELAY	YES	YES	YES	YES	(5,60)	Web timer values
WRKAREA	YES	YES	YES	YES	512	Common work area (CWA) size in bytes
XAPPC	YES	YES	NO	YES	NO	RACF class APPCLU required
XCFGROUP	YES	YES	YES	YES	DFHIR000	XCF group to use for MRO communications
XCMD	YES	YES	NO	YES	YES	SPI use default name for RACF check
XDCT	YES	YES	NO	YES	YES	Security check for transient data queues
XDB2	YES	YES	YES	YES	NO	Security check for DB2ENTRY resources
XEJB	YES	YES	NO	YES	YES	EJB security required
XFCT	YES	YES	NO	YES	YES	Security check for files
XHFS	YES	YES	NO	YES	YES	Security check for z/OS UNIX files
XJCT	YES	YES	NO	YES	YES	Security check for journals
XLT	YES	YES	YES	YES	NO	Transaction list table option or suffix
XPCT	YES	YES	NO	YES	YES	Security check for started transactions
XPPT	YES	YES	NO	YES	YES	Security check for programs
XPSB	YES	YES	NO	YES	YES	Security check for DL/I PSBs
XRES	YES	YES	NO	YES	YES	For resources subject to XRES security, checks use the default name for the RACF check. For a list of resources subject to XRES security checks, see Resource and command check cross-reference in the RACF Security Guide.

Table 10. System initialization parameters with override options and default settings (continued)

Parameter	PARM	SYSIN	System console	DFHSIT	Default value	Description
XRF	YES	YES	YES	YES	NO	Extended recovery feature (XRF) option
XTRAN	YES	YES	NO	YES	YES	Security check for transaction-attach
XTST	YES	YES	NO	YES	YES	Security check for temporary storage queues
XUSER	YES	YES	NO	YES	YES	Surrogate user checking to be done

ADI

The **ADI** parameter specifies the alternate delay interval in seconds for an alternate CICS region when you are running CICS with XRF.

ADI={30|number}

The minimum delay that you can specify is 5 seconds. This is the time that must elapse between the (apparent) loss of the surveillance signal in the active CICS region, and any reaction by the alternate CICS region. The corresponding parameter for the active is PDI. ADI and PDI need not have the same value.

Note: You must give careful consideration to the values you specify for the parameters ADI and JESDI so that they do not conflict with your installation's policy on PR/SM™ RESETTIME and the XCF INTERVAL and OPNOTIFY intervals. You should ensure that the sum of the interval you specify for ADI plus JESDI exceeds the interval specified by the XCF INTERVAL and the PR/SM policy interval RESETTIME.

AIBRIDGE

The **AIBRIDGE** parameter specifies whether the autoinstall user replaceable module (URM) is to be called when creating bridge facilities (virtual terminals) used by the 3270 bridge mechanism.

AIBRIDGE={AUTO|YES}

Valid values are as follows:

AUTO
This is the default, and specifies that bridge facilities are defined automatically by CICS. The autoinstall URM is not called.

YES
Specifies that the autoinstall URM is to be called for all new bridge facilities.

See the *CICS Customization Guide* for information about writing an autoinstall user replaceable module.

AICONS

The **AICONS** parameter specifies whether you want autoinstall support for consoles.

AICONS={NO|YES|AUTO}

You can also set the state of autoinstall support for consoles dynamically using the **SET AUTOINSTALL** command. Valid values for this parameter are as follows:

NO
This is the default, and specifies that the CICS regions does not support autoinstall for consoles.

YES
Specifies that console autoinstall is active and CICS is to call the

autoinstall control program, as part of the autoinstall process, when an undefined console issues an MVS MODIFY command to CICS.

AUTO
Specifies that console autoinstall is active but CICS is not to call the autoinstall control program when an undefined console issues an MVS MODIFY command to CICS. CICS is to autoinstall undefined consoles automatically without any input from the autoinstall control program. The 4-character termid required for the console's TCT entry is generated by CICS, beginning with a ¬ (logical not) symbol.

See the *CICS Customization Guide* for information about writing an autoinstall control program that supports consoles.

AIEXIT

The **AIEXIT** parameter specifies the name of the autoinstall user-replaceable program that you want CICS to use when autoinstalling local z/OS Communications Server terminals, APPC connections, virtual terminals, and shipped terminals and connections.

AIEXIT={DFHZATDX|DFHZATDY|name}
Autoinstall is the process of installing resource definitions automatically, using z/OS Communications Server logon or BIND data, model definitions, and an autoinstall program.

You can specify only one user-replaceable program on the **AIEXIT** parameter. Which of the CICS-supplied programs (or customized versions thereof) that you choose depends on what combination of resources you need to autoinstall.

For background information about autoinstall, see the *CICS Resource Definition Guide*. Valid values for this parameter are as follows:

DFHZATDX
A CICS-supplied autoinstall user program. This value is the default. It installs definitions for:
- Locally-attached z/OS Communications Server terminals
- Virtual terminals used by the CICS Client products
- Remote shipped terminals
- Remote shipped connections

DFHZATDY
A CICS-supplied autoinstall user program. It installs definitions for:
- Locally-attached z/OS Communications Server terminals
- Local APPC connections
- Virtual terminals used by the CICS Client products
- Remote shipped terminals
- Remote shipped connections

name The name of your own customized autoinstall program, which can be based on one of the supplied sample programs. For programming information about writing your own autoinstall program, see the *CICS Customization Guide*.

AILDELAY

The **AILDELAY** parameter specifies the delay period that elapses after all sessions between CICS and an autoinstalled terminal, APPC device, or APPC system are ended, before the terminal or connection entry is deleted.

AILDELAY={0|hhmmss}

All sessions are ended when the terminal or system logs off, or when a transaction disconnects it from CICS.

The **AILDELAY** parameter does not apply to the following types of autoinstalled APPC connection, which are not deleted:

- Sync level 2-capable connections (for example, CICS-to-CICS connections)
- Sync level 1-only, limited resource connections installed on a CICS that is a member of a generic resource group

Valid values for this parameter are as follows:

hhmmss

A 1 to 6-digit number. The default is 0. For non-LU6.2 terminals and LU6.2 single-session connections installed by a CINIT, 0 means that the terminal entry is deleted as soon as the session is ended. For LU6.2 connections installed by a BIND, 0 means that the connection is deleted as soon as all sessions are ended, but is reusable if a new BIND occurs before the deletion starts.

If you leave out the leading zeros, they are supplied (for example, 123 becomes 000123—that is, 1 minute 23 seconds).

AIQMAX

The **AIQMAX** parameter specifies the maximum number of z/OS Communications Server terminals and APPC connections that can be queued concurrently for autoinstall, the limit is the sum of installs and deletes.

AIQMAX={100|number}

The value for this parameter must be a number in the range 0 through 999. The default is 100. A zero value disables the autoinstall function.

Specify a number that is large enough to allow for installs and deletes of both APPC connections and terminals.

Note: This value does not limit the total number of terminals that can be autoinstalled. If you have a large number of terminals autoinstalled, shutdown can fail due to the **MXT** system initialization parameter being reached or CICS becoming short on storage. For information about preventing this possible cause of shutdown failure, see the *CICS Performance Guide*.

AIRDELAY

The **AIRDELAY** parameter specifies the delay period that elapses after an emergency restart before autoinstalled terminal and APPC connection entries that are not in session are deleted.

AIRDELAY={700|hhmmss}

The **AIRDELAY** parameter also applies when you issue a z/OS Communications Server**CEMT SET VTAM OPEN** command after a z/OS Communications Server abend and PSTYPE=MNPS is coded. This causes autoinstalled resources to be deleted, if the session was not restored and has not been used since the ACB was opened.

The **AIRDELAY** parameter does not apply to the following types of autoinstalled APPC connection, which are always written to the CICS global catalog and recovered during a warm or emergency start:

- Sync level 2-capable connections (for example, CICS-to-CICS connections)

- Sync level 1-capable, limited resource connections installed on a CICS that is a member of a generic resource group

hhmmss
A 1-to 6-digit number. If you leave out the leading zeros, they are supplied. The default is 700, meaning a delay of 7 minutes. A value of 0 means that autoinstalled definitions are not written to the global catalog and therefore are not restored at an emergency restart.

For guidance about the performance implications of setting different **AIRDELAY** values, see MVS and DASD: improving performance in the Performance Guide.

AKPFREQ

The **AKPREQ** parameter specifies the number of write requests to the CICS system log stream output buffer required before CICS writes an activity keypoint.

AKPFREQ={4000|number}

4000 This is the default. You are recommended to allow **AKPFREQ** to assume its default value.

number
number can be 0 (zero) or any value in the range 200 through 65535. You cannot specify a number in the range 1—199. If you specify AKPFREQ=0, no activity keypoints are written, with the following consequences:
- The CICS system log automatic deletion mechanism will not work so efficiently in this situation. The average system log occupancy would merely increase, maybe quite dramatically for some users. Without efficient automatic deletion, the log stream will spill onto secondary storage, and from there onto tertiary storage (unless you control the size of the log stream yourself).
- Emergency restarts are not prevented, but the absence of activity keypoints on the system log affects the performance of emergency restarts because CICS has to read backwards through the entire log stream.
- Backout-while-open (BWO) support is seriously affected, because without activity keypointing, tie-up records are not written to the forward recovery logs and the data set recovery point is not updated. Therefore, for forward recovery to take place, all forward recovery logs must be kept since the data set was first opened for update after the last image copy. For more information about the effect of AKPFREQ=0 on BWO, see “Effect of disabling activity keypointing” on page 9.

For more information about activity keypointing, see “Setting the activity keypoint frequency” in the *CICS Performance Guide*.

APPLID

The **APPLID** parameter specifies the z/OS Communications Server application identifier for this CICS region.

APPLID={DBDCCICS|applid}
Valid values are as follows:

applid This name, 1 through 8 characters, identifies the CICS region in the z/OS Communications Server network. It must match the name field specified in the APPL statement of the z/OS Communications Server

VTAM VBUILD TYPE=APPL definition. For an example, see the *CICS Transaction Server for z/OS Installation Guide*.

If CICS is running in a sysplex, its APPLID must be unique within the sysplex.

This parameter can be used also as the application identifier of this CICS region on IPIC connections.

When you define this CICS region to another CICS region, in an MRO or ISC over SNA CONNECTION definition you specify the APPLID using the NETNAME attribute; in an IPIC IPCONN definition you specify the APPLID using the APPLID attribute.

When sharing a DL/I database with a batch region, the APPLID is used by the batch region to identify the CICS region.

If the CICS region uses XRF, the form of the **APPLID** parameter is:

APPLID=(generic_applid,specific_applid)

Specifies the generic and specific XRF APPLIDs for the CICS region. Both APPLIDs must be 1 through 8 characters long and the specific APPLID must be unique within the sysplex. If, on CICS startup, the specified specific APPLID is found to duplicate the (specific or only) APPLID of any other CICS region currently active in the sysplex, CICS issues message DFHPA1946 and fails to initialize.

generic_applid

The generic APPLID for both the active and the alternate CICS regions. You must specify the same name for *generic_applid* on the **APPLID** system initialization parameter for both CICS regions. Because IRC uses the *generic_applid* to identify the CICS regions, there can be no IRC connection for an alternate CICS region until takeover has occurred and the alternate CICS region becomes the active CICS region.

When you define this XRF pair to another CICS region, in an MRO or ISC over SNA CONNECTION definition you specify the generic APPLID using the NETNAME attribute; in an IPIC IPCONN definition you specify the generic APPLID using the APPLID attribute.

When sharing a DL/I database with a batch region, this name is used by the batch region to identify the CICS region. CICS passes the generic applid to DBRC, because the alternate system does not sign on to DBRC until it has completed takeover.

Do not confuse the term *generic applid* with *generic resource name*. Generic APPLIDs apply only to CICS regions that use XRF. Generic resource names apply only to z/OS Communications Server generic resource groups.

specific_applid

Specifies the CICS region in the z/OS Communications Server network. It must match the label specified in the z/OS Communications Server VTAM VBUILD TYPE=APPL definition. You must specify a different *specific_applid* on the **APPLID** system initialization parameter for the active and for the alternate CICS region. Also, *generic_applid* and *specific_applid* must be different.

The active and alternate CICS regions use the z/OS Communications Server **VTAM MODIFY USERVAR** command to set a user application name variable, so end users do not need to know which CICS region is active at any instant.

AUTCONN

The **AUTCONN** parameter specifies that the reconnection of terminals after an XRF takeover is to be delayed, to allow time for manual switching.

AUTCONN={0|hhmmss} (alternate)

The delay is *hh* hours, *mm* minutes, and *ss* seconds. The default value of zero means that there is no delay in the attempted reconnection.

The interval specified is the delay before the CXRE transaction runs. CXRE tries to reacquire any XRF-capable (class 1) terminal session that failed to get a backup session, or failed the switch for some other reason. CXRE tries to reacquire other terminals that were in session at the time of the takeover.

Note that the same delay interval applies to the connection of terminals with AUTOCONNECT(YES) specified in the TYPETERM definition, at a warm or emergency restart, whether or not you have coded XRF=YES.

AUTODST

The **AUTODST** parameter specifies whether CICS is to activate automatic dynamic storage tuning for application programs.

AUTODST={NO|YES}

Valid values are as follows:

NO Automatic dynamic storage tuning is not required and CICS does not request this support from Language Environment.

YES Automatic dynamic storage tuning is required. This is activated during CICS startup when Language Environment is being initialized. CICS indicates to Language Environment that it is able to support dynamic storage tuning, and if Language Environment responds by indicating that it also supports the facility, CICS and Language Environment are synchronized to provide the required support.

For more information, see the appropriate z/OS Language Environment manual.

AUTORESETTIME

The **AUTORESETTIME** parameter specifies the action CICS should take if, at the next local midnight, the CICS time-of-day differs from the system time-of-day by more than 30 minutes; for example, setting clocks forward or back to adjust for summer and winter time.

AUTORESETTIME={NO|YES}

Valid values are as follows:

NO CICS issues message DFHAP1500 to indicate that a **CEMT PERFORM RESET** command is required to synchronize the CICS time-of-day with the system time-of-day.

YES CICS issues a **PERFORM RESET** command to synchronize the CICS time-of-day with the system time-of-day.

Note: Setting clocks back might cause end-of-day statistics to be written twice.

AUXTR

The **AUXTR** parameter specifies whether the auxiliary trace destination is to be activated at system initialization.

AUXTR={OFF|ON}

This parameter controls whether any of the three types of CICS trace entry are written to the auxiliary trace data set. The three types are: CICS system trace (see the SYSTR parameter), user trace (see the USERTR parameter), and exception trace entries (that are always made and are not controlled by a system initialization parameter).

OFF Do not activate auxiliary trace.

ON Activate auxiliary trace.

For details of internal tracing in main storage, see the INTTR parameter on page INTTR.

AUXTRSW

The **AUXTRSW** parameter specifies whether you want the auxiliary trace autoswitch facility.

AUXTRSW={NO|ALL|NEXT}

Valid values are as follows:

NO Disables the autoswitch facility.

NEXT Enables the autoswitch facility to switch to the next data set at end of file of the first data set used for auxiliary trace. Coding NEXT permits one switch only, and when the second data set is full, auxiliary trace is switched off.

ALL Enable the autoswitch facility to switch to the inactive data set at every end of file. Coding ALL permits continuous switching between the two auxiliary trace data sets, DFHAUXT and DFHBUXT, and whenever a data set is full, it is closed and the other data set is opened.

BMS

The **BMS** system initialization parameter specifies which version of basic mapping support you require in CICS.

BMS=({MINIMUM|STANDARD|FULL }[,COLD][,{UNALIGN |ALIGN}] [,{ DDS|NODDS}])

The function included in each version of BMS is shown in the *CICS Application Programming Guide*. The parameter **BMS** can be overridden during CICS initialization.

MINIMUM
The minimum version of BMS is included.

STANDARD
The standard version of BMS is included.

FULL The full version of BMS is included. This value is the default.

COLD
CICS deletes delayed messages from temporary storage, and destroys their interval control elements (ICEs). COLD forces the deletion of

messages regardless of the value in effect for START. If COLD is not specified, the availability of messages depend on the values in effect for the **START** and **TS** parameters.

UNALIGN
Specifies that all BMS maps assembled before CICS/OS/VS Version 1 Release 6 are unaligned. Results are unpredictable if the stated alignment does not match the actual alignment.

ALIGN
All BMS maps assembled before CICS/OS/VS Version 1 Release 6 are aligned.

DDS BMS is to load suffixed versions of map sets and partition sets. BMS first tries to load a version that has the alternate suffix (if the transaction uses the alternate screen size). If the load fails, BMS tries to load a version that has the default map suffix. If this fails too, BMS tries to load the unsuffixed version. DDS, which stands for "device dependent suffixing", is the default.

You need to use map suffixes only if the same transaction is to be run on terminals with different characteristics (in particular, different screen sizes). If you do not use suffixed versions of map sets and partition sets, CICS need not test for them.

NODDS
BMS is not to load suffixed versions of map sets and partition sets. Specifying NODDS avoids the search for suffixed versions, saving processor time.

Table 11. Versions of BMS

BMS version	Devices supported	Function provided
MINIMUM	All 3270 system display units and printers except SNA character string printers, which are defined as DEVICE(SCSPRINT) on the RDO TYPETERM definition or as TRMTYPE=SCSPRT in DFHTCT	SEND MAP command, RECEIVE MAP command, SEND CONTROL command. Default and alternate screens; extended attributes; map set suffixes; screen coordination with null maps; and block data
STANDARD	All devices are supported by BMS. These are listed in the *CICS Application Programming Guide*	All function of MINIMUM, as well as outboard formats, partitions, controlling a magnetic slot reader, NLEOM mode for 3270 system printers, SEND TEXT command, and Subsystem LDC controls.
FULL	All devices supported by BMS. These are listed in the *CICS Application Programming Guide*	Same as STANDARD, as well as terminal operator paging, cumulative mapping, page overflow, cumulative text processing, routing, message switching returning BMS-generated data stream to program before output.

BRMAXKEEPTIME

The **BRMAXKEEPTIME** parameter specifies the maximum time (in seconds) that bridge facilities (virtual terminals used by the 3270 bridge) are kept if they are not used.

BRMAXKEEPTIME={86400|number}

The client application can specify this timeout value when it sends a request to run a transaction using the Link3270 bridge. If the client specifies a larger value than the BRMAXKEEPTIME value in the AOR, then CICS will change this parameter in the link parameter list.

number

The maximum timeout value that a client can specify (in seconds), before an unused bridge facility is deleted. The value specified must be in the range 0 to 86400. A value of 0 means that bridge facilities are never kept at the end of a transaction, therefore CICS will not be able to run pseudoconversational transactions. This may be useful if the region is only used for inquiry transactions. The default value is 24 hours (86400 seconds).

CDSASZE

The **CDSASZE** system initialization parameter specifies the size of the CDSA.

CDSASZE={0K|number}

The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256KB). If the size specified is not a multiple of 256KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the **CDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 24-bit**
| **storage (below the line) is specified by the DSALIM system initialization**
| **parameter. You must allow at least 256K for each DSA in 24-bit storage for**
| **which you have not set a size.**

CHKSTRM

The **CHKSTRM** parameter specifies that terminal storage-violation checking is to be activated or deactivated.

CHKSTRM={CURRENT|NONE}

Valid values are as follows:

CURRENT

TIOA storage violations are to be checked.

NONE

TIOA storage-violation checking is to be deactivated.

You can also use the CICS-supplied transaction, CSFE, to switch terminal storage-violation checking on and off.

For information about checking for storage violations, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **CHKSTRM** parameter in PARM, SYSIN, or CONSOLE only.

CHKSTSK

The **CHKSTSK** parameter specifies that task storage-violation checking at startup is to be activated or deactivated.

CHKSTSK={CURRENT|NONE}

Valid values are as follows:

CURRENT
All storage areas on the transaction storage chain for the current task only are to be checked.

NONE
Task storage-violation checking is to be deactivated.

You can also use the CICS-supplied transaction, CSFE, to switch task storage-violation checking on and off.

For information about checking for storage violations, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **CHKSTSK** parameter in PARM, SYSIN, or CONSOLE only.

CICSSVC

The **CICSSVC** parameter specifies the number that you have assigned to the CICS type 3 SVC.

CICSSVC={216|number}

The default number is 216. A CICS type 3 SVC with the specified or default number must be installed in the LPA. For information about installing the CICS SVC, see the *CICS Transaction Server for z/OS Installation Guide*.

CICS checks if the SVC number supplied corresponds to the correct level of the CICS Type 3 SVC module, DFHCSVC. If the SVC number does not correspond to the correct level of DFHCSVC, the following can happen, depending on the value specified for the **PARMERR** system initialization parameter:

- CICS is terminated with a system dump
- The operator is allowed to retry using a different SVC number

For details of the **PARMERR** system initialization parameter, see PARMERR.

CILOCK

The **CILOCK** parameter specifies whether or not the control interval lock of a non-RLS VSAM file is to be kept after a successful read-for-update request.

CILOCK={NO|YES}

Valid values are as follows:

NO is the default and specifies that the control interval is to be freed. This allows other tasks to access other records in the same control interval, without an exclusive control conflict occurring. In these cases throughput should be greater. Note that the record lock on the record for which the read-for-update was first issued, still prevents other tasks from updating this record, even though the control interval lock has been released. When the record is rewritten or deleted, the read-for-update is reissued to VSAM as part of the update processing.

If a WRITE is issued by another task during a READ UDPATE, the WRITE receives a DUPREC condition.

YES specifies that the control interval is not to be freed. This means that a subsequent rewrite or delete request does not need to reissue the read-for-update request to VSAM. However, if other tasks attempt to access other records in the same control interval, an exclusive control conflict occurs on this control interval, forcing these tasks to wait until the update request completes.

CLINTCP

The **CLINTCP** parameter specifies the default client code page to be used by the DFHCNV data conversion table, but only if the **CLINTCP** parameter in the DFHCNV macro is set to SYSDEF.

CLINTCP={437|codepage}

The *codepage* is a field of up to 8 characters and can take the values supported by the **CLINTCP** parameter in the DFHCNV macro. See the *CICS Family: Communicating from CICS on System/390* for the list of valid code pages. The default is *437*.

CLSDSTP

The CLSDSTP system initialization parameter specifies the notification required for an **EXEC CICS ISSUE PASS** command.

CLSDSTP={NOTIFY|NONOTIFY}

This parameter is applicable to both autoinstalled and non-autoinstalled terminals. You can use the notification in a user-written node error program to reestablish the CICS session when a z/OS Communications Server VTAM CLSDST PASS request resulting from an EXEC CICS ISSUE PASS command fails. For more information about the EXEC CICS ISSUE PASS command, see the *CICS Application Programming Reference* .

NOTIFY
CICS requests notification from z/OS Communications Server when the EXEC CICS ISSUE PASS command is executed.

NONOTIFY
CICS does not request notification from z/OS Communications Server.

CLT

The **CLT** parameter specifies the suffix for the command list table (CLT), if this SIT is used by an alternate XRF system.

CLT=xx (alternate)

The name of the table is DFHCLTxx. For information about coding the macros for this table, see the *CICS Resource Definition Guide*.

CMDPROT

The **CMDPROT** parameter specifies that you want to allow, or inhibit, CICS validation of start addresses of storage referenced as output parameters on EXEC CICS commands.

CMDPROT={YES|NO}
Valid values are as follows:

YES CICS validates the initial byte at the start of any storage that is referenced as an output parameter on EXEC CICS commands to ensure that the application program has write access to the storage. This ensures that CICS does not overwrite storage on behalf of the application program when the program itself cannot do so. If CICS detects that an application program has asked CICS to write into an area to which the application does not have addressability, CICS abends the task with an AEYD abend.

The level of protection against bad addresses depends on the level of storage protection in the CICS environment. The various levels of protection provided when you specify CMDPROT=YES are shown in Table 12.

NO CICS does not perform any validation of addresses of the storage referenced by EXEC CICS commands. This means that an application program could cause CICS to overwrite storage to which the application program itself does not have write access.

Table 12. Levels of protection provided by CICS validation of application-supplied addresses

Environment	Execution key of affected programs	Types of storage referenced by applications that cause AEYD abends
Read-only storage (RENTPGM=PROTECT)	CICS-key and user-key	CICS key 0 read-only storage (RDSA and ERDSA).
Subsystem storage protection (STGPROT=YES)	User-key	All CICS-key storage (CDSA and ECDSA)
Transaction isolation (TRANISO=YES)	User-key and ISOLATE(YES)	Task-lifetime storage of all other transactions
Transaction isolation (TRANISO=YES)	User-key and ISOLATE(NO)	Task-lifetime storage of all **except** other user key and ISOLATE(NO) transactions
Base CICS (all storage is CICS key 8 storage) (RENTPGM=NOPROTECT; STGPROT=NO; and TRANISO=NO)	CICS-key and user-key	MVS storage only

CMDSEC

The **CMDSEC** parameter specifies whether or not you want CICS to honor the CMDSEC option specified on a transaction's resource definition.

CMDSEC={ASIS|ALWAYS}
Valid values are as follows:

ASIS means that CICS honors the CMDSEC option defined in a transaction's resource definition. CICS calls its command security checking routine only when CMDSEC(YES) is specified in a transaction resource definition.

ALWAYS
CICS overrides the CMDSEC option, and always calls its command security checking routine to issue the appropriate call to the SAF interface.

Note:

1. Specify ALWAYS when you want to control the use of the SPI in all your transactions. Be aware that this might incur additional overhead. The additional overhead is caused by CICS issuing the command security calls on every eligible EXEC CICS command, which are *all* the system programming interface (SPI) commands.
2. If you specify ALWAYS, command checking applies to CICS-supplied transactions such as CESN and CESF. You must authorize all users of CICS-supplied transactions to use the internal CICS resources for the transactions, otherwise you will get unexpected results in CICS-supplied transactions.

Restrictions You can specify the CMDSEC parameter in the SIT, PARM, or SYSIN only.

CONFDATA

The **`CONFDATA`** parameter specifies whether CICS is to suppress user data that might otherwise appear in CICS trace entries or in dumps.

`CONFDATA={SHOW|HIDETC}`

This option applies to initial input data received on:

- A z/OS Communications Server RECEIVE ANY operation
- An MRO connection
- An IPIC connection
- FEPI screens and RPLAREAs

This option also applies to the CICS client use of a Virtual Terminal. Data is traced before and after codepage conversion and is suppressed if HIDETC is used in combination with CONFDATA YES in the transaction.

SHOW

Data suppression is not in effect. User data is traced regardless of the CONFDATA option specified in transaction resource definitions. This option overrides the CONFDATA option in transaction resource definitions.

HIDETC

CICS is to 'hide' user transport data from CICS trace entries. The action taken by CICS is subject to the individual CONFDATA attribute on the transaction resource definition (see Table 13 on page 142).

If you specify CONFDATA=HIDETC, CICS processes z/OS Communications Server, MRO, IS, and FEPI user data as follows:

- **z/OS Communications Server**: CICS clears the z/OS Communications Server RAIA containing initial input as soon as it has been processed, and before the target transaction has been identified.

  The normal trace entries (FC90 and FC91) are created on completion of the RECEIVE ANY operation with the text “`SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT`” replacing all the user data except the first 4 bytes of normal data, or the first 8 bytes of function management headers (FMHs).

  CICS then identifies the target transaction for the data. If the transaction definition specifies CONFDATA(NO), CICS traces the user data that it suppressed from the FC90 trace in the trace entry AP FC92. This trace entry is not created if the transaction is defined with CONFDATA(YES).

- **MRO**: CICS does not trace the initial input received on an MRO link.

  The normal trace entries (DD16, DD23, and DD25) are created with the text `SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT` replacing all the user data.

  CICS then identifies the target transaction for the data. If the transaction definition specifies CONFDATA(NO), CICS traces the user data that it suppressed from DD16 in the trace entry AP FC92. This special trace entry is not created if the transaction is defined with CONFDATA(YES).
- **IPIC**: Trace points SO 0201 and SO 0202 suppress buffer data with the message "Trace data suppressed because it may contain sensitive data". Subsequent trace point SO 029D (buffer continuation) and buffer data from trace points WB 0700 and WB 0701 is suppressed.

  If the transaction definition specifies CONFDATA(NO), IS trace entries are created with the user data, as normal.

  If the transaction definition specifies CONFDATA(YES), user data from IS trace points IS 0602, IS 0702, and IS 0906 is replaced with "SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT". Data from IS trace points IS 0603 and IS 0703 is not shown.
- **FEPI**: FEPI screens and RPL data areas (RPLAREAs) areas are suppressed from all FEPI trace points if CONFDATA(YES) is specified in the transaction resource definition. The user data in the FEPI trace points AP 1243, AP 1244, AP 145E, AP 145F, AP 1460, AP 1461, AP 1595, AP 1596, AP 1597, AP 1598, and AP 1599 is replaced with the message `SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT`. If the transaction definition specifies CONFDATA(NO), the FEPI trace entries are created with the user data as normal.

Mirror transactions: The CICS-supplied mirror transaction definitions are specified with CONFDATA(YES). This ensures that, when you specify CONFDATA=HIDETC as a system initialization parameter, CICS regions running mirror transactions suppress user data as described for z/OS Communications Server, MRO, and IS data.

Modified data: By waiting until the transaction has been identified to determine the CONFDATA option, z/OS Communications Server, MRO, or IS data may have been modified (for example, it may have been translated to upper case).

The interaction between the **CONFDATA** system initialization parameter and the CONFDATA attribute on the transaction resource definition is shown in Table 13.

Table 13. Effect of CONFDATA system initialization and transaction definition parameters

CONFDATA on transaction	CONFDATA system initialization parameter	
	SHOW	HIDETC
NO	Data not suppressed	Data suppressed
YES	Data not suppressed	Data suppressed

You cannot modify the CONFDATA option while CICS is running. You must restart CICS to apply a change.

Restrictions: You can specify the **CONFDATA** parameter in the SIT, PARM, and SYSIN only.

CONFTXT

The **CONFTXT** system initialization parameter specifies whether CICS is to prevent z/OS Communications Server from tracing user data.

CONFTXT={NO|YES}

Valid values are as follows:

NO CICS does not prevent z/OS Communications Server from tracing user data.

YES CICS prevents z/OS Communications Server from tracing user data.

Restrictions You can specify the **CONFTXT** parameter in the SIT, PARM, and SYSIN only.

CPSMCONN

The **CPSMCONN** parameter specifies whether you want CICS to invoke the specified CICSPlex® SM component to initialize the region.

CPSMCONN={NO|CMAS|LMAS|WUI}

You can initialize the region as one of the following:

- A CICSPlex SM address space (CMAS)
- A CICSPlex SM managed application system (MAS)
- A CICSPlex SM Web User Interface server

NO Do not invoke any CICSPlex SM initialization code in this region.

CMAS

Invoke CICSPlex SM code automatically during CICS initialization to initialize the region as a CMAS. The other information CICSPlex SM needs for a CMAS is taken from the CMAS parameters read from the EYUPARM data set, and from resource definitions installed from the CSD from group list EYU420L0.

Specifying **CPSMCONN**=CMAS is the recommended alternative to specifying the CICSPlex SM CMAS initialization program in a CICS post-initialization program list table (PLTPI).

Note: If you specify **CPSMCONN**=CMAS, ensure that your CICS region startup JCL EXEC statement specifies the name of the CICSPlex SM CMAS program, EYU9XECS. For example:

```
//CMAS    EXEC PGM=EYU9XECS,...,...
```

LMAS Invoke CICSPlex SM code automatically during CICS initialization to initialize the region as a local MAS. The other information CICSPlex SM needs for a MAS is taken from the MAS parameters read from the EYUPARM data set.

Specifying **CPSMCONN**=LMAS is the recommended alternative to specifying the CICSPlex SM MAS initialization program in a CICS post-initialization program list table (PLTPI).

WUI Invoke CICSPlex SM code automatically during CICS initialization to initialize the region as a CICSPlex SM Web User Interface server. The other information CICSPlex SM needs is taken from the MAS and WUI parameters read from the EYUPARM and EYUWUI data sets respectively.

Specifying **CPSMCONN**=WUI is the recommended alternative to specifying the CICSPlex SM MAS and WUI initialization and shutdown programs in initialization and shutdown program list tables (PLTPI and PLTSD).

Note that using the **CPSMCONN** parameter has the same effect as specifying the relevant CICSPlex SM program in a program list table. This means that MASPLTWAIT and other PLT-related CICSPlex SM parameters are still valid and should be specified as necessary.

For information about starting CICSPlex SM address spaces, see the *CICS Transaction Server for z/OS Installation Guide*.

CRLPROFILE

The **CRLPROFILE** parameter specifies the name of the profile that is used to authorize CICS to access the certification revocation lists (CRLs) that are stored in an LDAP server.

CRLPROFILE=*PROFILENAME*

The profile name is specified in the external security manager's LDAPBIND general resource class that contains bind information for an LDAP server. The profile name must be uppercase and can be up to 246 characters in length.

The profile must contain the name of the LDAP server and the distinguished name and password of a user who is authorized to extract certification revocation lists from it. For more information about setting up the profile, see the *CICS RACF Security Guide*.

Specifying this parameter means that CICS checks each client certificate during the SSL negotiation for a revoked status using the certificate revocation lists in the LDAP server. If the certificate is revoked, CICS closes the connection immediately.

If the **CRLPROFILE** parameter is omitted or invalid, or the specified profile contains invalid data, or if the LDAP server identified by the profile is unavailable, CICS does not check the revoked status of certificates during SSL handshakes.

CSDACC

The **CSDACC** parameter specifies the type of access to the CSD to be permitted to this CICS region.

CSDACC={READWRITE|READONLY}

This parameter is effective only when you start CICS with a START=COLD parameter. If you code START=AUTO, and CICS performs a warm or emergency restart, the file resource definitions for the CSD are recovered from the CICS global catalog. However, you can redefine the type of access permitted to the CSD dynamically with a **CEMT SET FILE** or **EXEC CICS SET FILE** command.

READWRITE
: Read/write access is allowed, permitting the full range of CEDA, CEDB, and CEDC functions to be used.

READONLY
: Read access only is allowed, limiting the CEDA and CEDB transactions to only those functions that do not require write access.

CSDBKUP

The **CSDBKUP** parameter specifies whether or not the CSD is eligible for BWO.

CSDBKUP={STATIC|DYNAMIC}
If you want to use BWO, specify CSDBKUP=DYNAMIC.

The **CSDBKUP**, **CSDRECOV**, and **CSDFRLOG** system initialization parameters interact according to how they are specified. For information about their effects when the SIT is assembled and during CICS override processing, see "Planning for backup and recovery" on page 51.

STATIC
All CICS files open for update against the CSD data set must be quiesced before a DFHSM and DFDSS backup of the CSD data set. The files must remain quiesced during the backup.

DYNAMIC
DFHSM and DFDSS are allowed to make a data set back up copy while CICS is updating the CSD.

Note that CSDBKUP=DYNAMIC is valid only if you have also specified CSDRECOV=ALL.

CSDBUFND

The **CSDBUFND** parameter specifies the number of buffers to be used for CSD data.

CSDBUFND=*number*
The minimum you should specify is the number of strings coded on the **CSDSTRNO** parameter plus 1, up to a maximum of 32768. Note that this parameter is used only if you have also coded CSDLSRNO=NONE; if you have coded CSDLSRNO=number, CSDBUFND is is set to a value of 0 and ignored.

If you specify a value for **CSDBUFND** that is less than the required minimum (the CSDSTRNO value plus 1), VSAM automatically changes the number of buffers to the number of strings plus 1 when CICS issues the OPEN macro for the CSD.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

CSDBUFNI

The **CSDBUFNI** parameter specifies the number of buffers to be used for the CSD index.

CSDBUFNI=*number*
The minimum you should specify is the number of strings coded on the **CSDSTRNO** parameter, up to a maximum of 32768. This parameter is used only if you have also coded CSDLSRNO=NONE; if you have coded CSDLSRNO=number, CSDBUFNI is is set to a value of 0 and ignored.

If you specify a value for **CSDBUFNI** that is less than the required minimum (the CSDSTRNO value), VSAM automatically changes the number of buffers to the number of strings when CICS issues the OPEN macro for the CSD.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

CSDDISP

The **CSDDISP** parameter specifies the disposition of the data set to be allocated to the CSD.

CSDDISP={OLD|SHR}

If no JCL statement for the CSD exists when it is opened, the open is preceded by a dynamic allocation of the CSD using this disposition. If a DD statement exists in the JCL of the CICS startup job, it takes precedence over this disposition.

OLD The disposition of the CSD is set to OLD if dynamic allocation is performed.

SHR The disposition of the CSD is set to SHR if dynamic allocation is performed.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

CSDDSN

The **CSDDSN** parameter specifies the 1-44 character JCL data set name (DSNAME) to be used for the CSD.

CSDDSN=*name*

If no JCL statement exists for the CSD when it is opened, the open is preceded by a dynamic allocation of the CSD using this DSNAME. If a DD statement exists in the JCL of the CICS startup job, it takes precedence over this DSNAME.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

CSDFRLOG

The **CSDFRLOG** parameter specifies a number that corresponds to the journal name that CICS uses to identify the forward recovery log stream for the CSD.

CSDFRLOG=number

This parameter is meaningful only if CSDRECOV=ALL and CSDRLS=NO are specified, otherwise it is ignored. If you specify CSDRLS=NO and CSDRECOV=ALL, but omit CSDFRLOG (or specify CSDFRLOG=NO), the SIT assembly fails. However, if you specify an invalid combination as SIT overrides, CICS initialization will fail.

CSDBKUP, **CSDRECOV** and **CSDFRLOG** are ignored if CSDRLS=YES is specified. This is because recovery attributes (that is, the recoverability, the forward recovery LSN, and the BWO eligibility) must be specified in the ICF catalog for data sets that are opened in RLS mode.

The recovery attributes can also be specified (optionally) in the ICF catalog when you specify CSDRLS=NO. If you specify recovery attributes in both the ICF catalog and as system initialization parameters, the ICF catalog values are used (but see the next paragraph).

For a CSD opened in a non-RLS mode (CSDRLS=NO), the **CSDBKUP**, **CSDRECOV** and **CSDFRLOG** system initialization parameters interact according to how they are specified. For information about their effects when the SIT is assembled and during CICS override processing, see “Planning for backup and recovery” on page 51.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

number
The journal number that identifies the user journal that CICS is to use for forward recovery of the CSD. CICS journal names are of the form DFHJ*nn* where *nn* is a number in the range 1 through 99. CICS maps the resulting journal name (DFHJ01—DFHJ99) to an MVS log stream.

CSDINTEG

The **CSDINTEG** parameter specifies the level of read integrity for the CSD if it is accessed in RLS mode.

CSDINTEG={UNCOMMITTED|CONSISTENT|REPEATABLE}
If the CSD is not accessed in RLS mode (CSDRLS=NO), a value for CSDINTEG of CONSISTENT or REPEATABLE will be changed to UNCOMMITTED.

UNCOMMITTED
The CSD is read without read integrity. For each read request, CICS obtains the current value of the record as known to VSAM. No attempt is made to serialize this read request with any concurrent update activity for the same record. The record returned may be a version updated by another RDO task but not yet committed, and this record could change if the update is subsequently backed out.

CONSISTENT
CICS reads the CSD with consistent read integrity. If a record is being modified by another RDO task, the READ request waits until the update is complete, the timing of which depends on whether the CSD is recoverable or non-recoverable:

- For a recoverable CSD, the READ request completes when the updating transaction completes its next syncpoint or rollback.
- For a non-recoverable CSD, the READ completes as soon as the VSAM request performing the update completes.

REPEATABLE
CICS reads the CSD with repeatable read integrity. If the record is being modified by another RDO task, the READ request waits until the update is complete, the timing of which depends on whether the CSD is recoverable or non-recoverable:

- For a recoverable CSD, the READ request completes when the updating transaction completes its next syncpoint or rollback.
- For a non-recoverable CSD, the READ completes as soon as the VSAM request performing the update completes.

After the CSD read completes, a shared lock remains held until syncpoint. This guarantees that a CSD record read within an RDO task cannot be modified until the end of the task (for example, a CEDA transaction) that is reading the CSD.

CSDJID

The **CSDJID** parameter specifies the journal identifier of the journal that you want CICS to use for automatic journaling of file requests against the CSD.

CSDJID={NO|number}

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

NO You do **not** want automatic journaling for the CSD. This is the default.

number

A number in the range 1 through 99 to identify the journal that CICS is to use for automatic journaling for the CSD. Mapping to a log stream works in the same way that CSDFRLOG does, that is, *nn* maps to DFHJnn. 01 no longer maps to the system log.

The automatic journaling options enforced for the CSD when you code CSDJID=number are JNLADD=BEFORE and JNLUPDATE=YES. These options are sufficient to record enough information for a user-written forward recovery utility. No other automatic journaling options are available for the CSD. For information about the options JNLADD=BEFORE and JNLUPDATE=YES, see the *CICS Resource Definition Guide*.

CSDLSRNO

The **CSDLSRNO** system initialization parameter specifies whether the CSD is to be associated with a local shared resource (LSR) pool.

CSDLSRNO={1|number|NONE|NO}

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog. However, you can redefine the LSR pool attribute for the CSD dynamically with an EXEC CICS SET FILE command.

1 The default LSR pool number is 1.

number

| The number of the LSR pool the CSD is to be associated with. The
| number of the pool must be in the range 1 through 255.

NONE|NO

The CSD is not to be associated with a local shared resource pool.

CSDRECOV

The **CSDRECOV**system initialization parameter specifies whether the CSD is a recoverable file.

CSDRECOV={NONE|ALL|BACKOUTONLY}

The **CSDBKUP**, **CSDRECOV**, and **CSDFRLOG** system initialization parameters interact according to how they are specified, if CSDRLS=NO is specified. If CSDRLS=YES is specified, these parameters are ignored, because the recovery attributes must be specified in the VSAM catalog (using the BWO, LOG, and LOGSTREAMID parameters on DEFINE CLUSTER or ALTER CLUSTER). If CSDRLS=NO is specified but LOG has been specified in the VSAM catalog, the recovery attributes are taken from the VSAM catalog, and CSDBKUP, CSDRECOV, and CSDFRLOG do not need to be specified. If they are specified, however, the rules given in “Planning for backup and recovery” on page 51 must still be followed.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog.

NONE
The CSD is not recoverable.

ALL You want both forward recovery and backout for the CSD. If you code ALL, also specify CSDFRLOG with the journal identification of the journal to be used for forward recovery of the CSD.

Note: If the journal you specify for logstreams associated with CSD recovery (CSDJID, CSDFRLOG, and possibly the log of logs, DFGLGLOG) is a DASD-only log stream, there can be delays when you use the CEDA transaction if the log stream requires a new connection. This delay is because the MVS system logger is formatting the staging data set. Symptoms of the problem are:

```
DFHLG0771 07/08/01 03:30:42 IYOT1 A temporary error condition occurred
during MVS logger operation IXGWRITE for logstream xxxxxx.yyyyyy.zzzzzz.
MVS logger codes: X'00000008', X'00000868'.
```

If the CSD is the only file using those logstreams, CICS disconnects from the log when you end the CEDA transaction. The next time you run a CEDA transaction, CICS reconnects to the log stream and the MVS system logger allocates and formats a new staging data set.

BACKOUTONLY
CSD recovery is limited to file backout only. If you specify backout for the CSD, CICS uses the system log to record before images for backout purposes.

CSDRLS

The **CSDRLS** system initialization parameter specifies whether CICS is to access the CSD in RLS mode.

CSDRLS={NO|YES}
Valid values are as follows:

NO The CSD is opened in non-RLS mode, as specified on the **CSDLSRNO** parameter.

YES The CSD is opened in RLS mode. This enables you to update the CSD concurrently from several CICS regions, provided all the regions specify CSDRLS=YES. If a CICS region opens the CSD in RLS mode, another CICS region cannot open it in non-RLS mode. The first CICS region to open the CSD in a sysplex with SMSVSAM determines the access mode for all regions.

Your CSD must be defined to support RLS access: the IMBED option must not be specified, and recovery attributes must be defined in the VSAM catalog. The *CICS Transaction Server for z/OS Installation Guide* explains the data set characteristics required to support RLS access. If your CSD does not meet these requirements, it will fail to open.

If you specify both RLS and local shared resource (CSDLSRNO=*number*), RLS takes precedence.

If you specify `CSDRLS=YES`, the **CSDRECOV**, **CSDFRLOG**, and **CSDJID** parameters are ignored. You must specify the recovery attributes for an RLS-mode CSD in the ICF catalog entry for the CSD.

Note: If you define a recoverable CSD for RLS-mode access, you have to quiesce all RLS activity against the CSD before you can update the CSD using the batch utility program, DFHCSDUP. You can use the **SET DSNAME QUIESCE** command to do this, to ensure that no CEDA, CEDB, or CEDC transactions can run until you unquiesce the data set on completion of the batch job.

CSDSTRNO

The **CSDSTRNO** system initialization parameter specifies the number of concurrent requests that can be processed against the CSD.

CSDSTRNO={6|number}

When the number of requests reaches the **CSDSTRNO** value, CICS automatically queues any additional requests until one of the active requests terminates.

CICS requires two strings per CSD user, and you can increase the **CSDSTRNO** value, in multiples of two, to allow more than one concurrent CEDA user.

See "Multiple users of the CSD within a CICS region (non-RLS)" on page 45 before you code this parameter.

This parameter is effective only on a CICS cold or initial start. On a warm or emergency restart, file resource definitions for the CSD are recovered from the global catalog. However, you can redefine the number of strings for the CSD dynamically with an EXEC CICS SET FILE command.

6 The default number of concurrent requests for the CSD is 6.

number
This number must be a multiple of 2, in the range 2 through 254.

CWAKEY

The **CWAKEY** system initialization parameter specifies the storage key for the common work area (CWA) if you are operating CICS with storage protection (STGPROT=YES).

CWAKEY={USER|CICS}

You specify how much storage you want for the CWA on the **WRKAREA** parameter. The permitted values are USER (the default), or CICS:

USER CICS obtains storage for the CWA in user key. This allows a user program executing in any key to modify the CWA.

CICS CICS obtains storage for the CWA in CICS key. This means that only programs executing in CICS key can modify the CWA, and user-key programs have read-only access.

If CICS is running without storage protection, the CWAKEY parameter is ignored, and the CWA is always allocated from CICS-key storage.

DAE

The **DAE** system initialization parameter specifies the default DAE action when new system dump table entries are created.

DAE={NO|YES}

Valid values are as follows:

NO New system dump table entries will be created with DAEOPTION(NODAE). This means that the system dump will not be suppressed by the MVS Dump Analysis and Elimination (DAE) component.

YES New system dump table entries will be created with DAEOPTION(DAE). This means that the system dump is eligible for suppression by the MVS DAE component.

For more information about the DAEOPTION option, see the *CICS System Programming Reference*.

DATFORM

The **DATFORM** system initialization parameter specifies the external date display standard that you want to use for CICS date displays.

DATFORM={MMDDYY|DDMMYY|YYMMDD}

An appropriate indicator setting is made in the CSA. It is examined by CICS supplied system service programs that display a Gregorian date. CICS maintains the date in the form 0CYYDDD in the CSA (where C=0 for years 19xx, 1 for years 20xx, and so on; YY=year of century; and DDD=day of year), and converts it to the standard you specify for display.

The DATFORM option selects the order in which the date is to be displayed. It does not select the format of the year. Both YY and YYYY formats are displayed.

MMDDYY
The date is in the form of month-day-year, MMDDYY and MMDDYYYY.

DDMMYY
The date is in the form of day-month-year, DDMMYY and DDMMYYYY.

YYMMDD
The date is in the form of year-month-day, YYMMDD and YYYYMMDD.

DB2CONN

The **DB2CONN** system initialization parameter specifies whether you want CICS to start the DB2 connection automatically during initialization.

DB2CONN={NO|YES}

Valid values are as follows:

NO Do not automatically invoke DFHD2CM0, the CICS DB2 attach program, during initialization.

YES Invoke the CICS DB2 attach program, DFHD2CM0, automatically during CICS initialization. The other information CICS needs for starting the attachment is taken from CICS DB2 connection resource definitions installed from the CSD.

Specifying DB2CONN=YES is the recommended alternative to specifying the CICS DB2 attach programs in the CICS post-initialization program list table (PLT).

DBCTLCON

The **DBCTLCON** system initialization parameter specifies whether you want CICS to start the DBCTL connection automatically during initialization.

DBCTLCON={NO|YES}

Valid values are as follows:

NO Do not automatically invoke DFHDBCON, the CICS DBCTL attach program, during initialization.

YES Invoke the CICS DBCTL attach program, DFHDBCON, automatically during CICS initialization. The other information CICS needs for starting the attachment, such as the DRA startup table suffix or the DBCTL subsystem name, is taken from an INITPARM system initialization parameter.

Specifying DBCTLCON=YES means you don't need to define the DBCTL attach program in the CICS post-initialization program list table (PLT).

DEBUGTOOL

The **DEBUGTOOL** system initialization parameter specifies whether you want to use debugging profiles to select the programs that will run under the control of a debugging tool.

DEBUGTOOL={NO|YES}

The following debugging tools use debugging profiles:

- Debug Tool, for compiled language application programs (programs written in COBOL, PL/I, C, C++ and Assembler)
- Remote debugging tools (for compiled language application programs and Java programs)

Other debugging mechanisms, such as the CICS Execution Diagnostic Facility (CEDF) do not use debugging profiles.

NO Specifies that you do not want to use CICS debugging profiles to select the programs that will run under the control of a debugger tool.

YES

Specifies that you want to use CICS debugging profiles to select the programs that will run under the control of a debugging tool.

For more information, see the *CICS Application Programming Guide*.

DFLTUSER

The **DFLTUSER** system initialization parameter specifies the RACF userid of the default user; that is, the user whose security attributes are used to protect CICS resources in the absence of other, more specific, user identification.

DFLTUSER={CICSUSER|userid}

For example, except in the case of terminals defined with preset security, the security attributes of the default user are assigned to terminal users who do not sign on.

The specified userid must be defined to RACF if you are using external security (that is, you have specified the system initialization parameter SEC=YES).

The specified userid is signed on during CICS initialization. If it cannot be signed on, CICS fails to initialize.

Restrictions You can specify the DFLTUSER parameter in the SIT, PARM, or SYSIN only.

DIP

The **DIP** system initialization parameter specifies whether the batch data interchange program, DFHDIP, is to be included.

DIP={NO|YES}
This program supports the batch controller functions of the IBM 3790 Communication System and the IBM 3770 Data Communication System. Support is provided for the transmit, print, message, user, and dump data sets of the 3790 system. For the effect of this parameter, see "Defining CICS resource table and module keywords" on page 117.

DISMACP

The **DISMACP** system initialization parameter specifies whether CICS is to disable any transaction that terminates abnormally with an ASRD or ASRE abend.

DISMACP={YES|NO}
DISMACP=YES has no effect if the ASRD or ASRE abend is handled by an active abend exit. An abend might be caused by a user program invoking a CICS macro, or referencing the CSA, or the TCA.

DOCCODEPAGE

The **DOCCODEPAGE** system initialization parameter specifies the default host code page to be used by the document domain.

DOCCODEPAGE={037|codepage}
The *codepage* is a field of up to 8 characters. If *codepage* value is not specified, the default *doccodepage* is set to *037*.

The standard CICS form of a host code page name consists of the code page number (or more generally CCSID) written using 3 to 5 decimal digits as necessary then padded with trailing spaces to 8 characters. For code page 37, which is fewer than 3 digits, the standard form is 037. CICS accepts any decimal number of up to 8 digits (padded with trailing spaces) in the range 1 to 65535 as a code page name, even if it is not in the standard form.

The DOCCODEPAGE parameter must specify an EBCDIC-based code page if any symbol processing is required, as the delimiters used for symbol and symbol list processing are assumed to be in EBCDIC.

DSALIM

The **DSALIM** system initialization parameter specifies the upper limit of the total amount of storage within which CICS can allocate the individual dynamic storage areas (DSAs) that reside in 24-bit storage (below 16 MB, also known as below the line).

DSALIM={5M|*number*}
Valid values are as follows:

5M The default **DSALIM** value is 5 MB (5,242,880 bytes).

number
A value in the range 2 MB to 16 MB (2,097,152 bytes to 16,777,216 bytes), in multiples of 256 KB (262,144 bytes). If the size specified is not a multiple of 256 KB, CICS rounds the value up to the next multiple.

You can specify *number* in bytes (for example, 4194304), a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M). See "Coding conventions for DSA limits" in the *CICS Performance Guide*

From the storage that you specify using **DSALIM**, CICS allocates the CDSA, UDSA, SDSA, and RDSA. CICS allocates the UDSA in multiples of 1 MB when transaction isolation is active, but in multiples of 256 KB in CICS regions without transaction isolation. The other DSAs in 24-bit storage are allocated in multiples of 256 KB, with or without transaction isolation. For information about the contents of each of the dynamic storage areas, see “CICS dynamic storage areas” in the *CICS Performance Guide*.

The maximum value that you can specify for **DSALIM** is limited by the following factors:

- The configuration of your MVS storage, which governs how much private storage remains below the line.
- The amount of MVS storage, outside the DSAs, that you require to satisfy MVS GETMAIN requests for 24-bit storage (below the line).

For methods to estimate the amount of storage to specify on the **DSALIM** parameter, see “Estimating and setting DSALIM” in the *CICS Performance Guide*.

Note: If you change the **DSALIM** value while CICS is running, the change is cataloged in the local catalog. If **DSALIM** is specified in the system initialization table, the cataloged value specified by the change overrides the value of the **DSALIM** system initialization parameter on an initial, cold, or warm start. The cataloged value is not used if you specify **DSALIM** as a system initialization parameter override (for example, in SYSIN), or if you reinitialize the CICS catalog data sets.

DSHIPIDL

The **DSHIPIDL** system initialization parameter specifies the minimum time, in hours, minutes, and seconds, that an inactive shipped terminal definition must remain installed in this region.

DSHIPIDL={020000|hhmmss}

When the timeout delete mechanism is invoked, only those shipped definitions that have been inactive for longer than the specified time are deleted.

You can use this parameter in a transaction routing environment, on the application-owning and intermediate regions, to prevent terminal definitions having to be reshipped because they have been deleted prematurely.

The default minimum idle time is 2 hours.

hhmmss

A 1- to 6-digit number in the range 0-995959. Numbers that have fewer than six digits are padded with leading zeros.

DSHIPINT

The **DSHIPINT** system initialization parameter specifies the interval between invocations of the timeout delete mechanism.

DSHIPINT={120000|0|hhmmss}

The timeout delete mechanism removes any shipped terminal definitions that have not been used for longer than the time specified by the DSHIPIDL parameter.

You can use this parameter in a transaction routing environment, on the application-owning and intermediate regions, to control:

- How often the timeout delete mechanism is invoked
- The approximate time of day at which a mass delete operation is to take place, relative to CICS startup

Note: For more flexible control over when mass delete operations take place, you can use a CEMT SET DELETSHIPPED or EXEC CICS SET DELETSHIPPED command to reset the interval. (The revised interval starts *from the time the command is issued*, **not** from the time the remote delete mechanism was last invoked, nor from CICS startup.)

0
: The timeout delete mechanism is not invoked. You might set this value in a terminal-owning region, or if you are not using shipped definitions.

hhmmss
: A 1- to 6-digit number in the range 1-995959. Numbers that have fewer than six digits are padded with leading zeros.

DSRTPGM

| The **DSRTPGM** system initialization parameter specifies the name of a distributed
| routing program. The distributed routing program must be specified in the routing
| region and each target CICS region.

DSRTPGM={NONE|DFHDSRP|program-name|EYU9XLOP}

The program can dynamically route:

- Eligible CICS business transaction services (BTS) processes and activities

  For information about which BTS processes and activities are eligible for dynamic routing, see BTS overview in Business Transaction Services.
- Eligible non-terminal-related EXEC CICS START requests.

  For information about which non-terminal-related START requests are eligible for dynamic routing, see Routing transactions invoked by START commands in the Intercommunication Guide.

DFHDSRP
: The CICS sample distributed routing program.

EYU9XLOP
: The CICSPlex SM routing program.

NONE
: For eligible CICS BTS processes and activities, no routing program is invoked. BTS processes and activities cannot be dynamically routed.

  For eligible non-terminal-related START requests, the CICS sample distributed routing program, DFHDSRP, is invoked.

program-name
: The name of a user-written program.

Note: See also the **DTRPGM** parameter, used to name the dynamic routing program.

DTRPGM

The **DTRPGM** system initialization parameter specifies the name of a dynamic routing program.

DTRPGM={DFHDYP|program-name}

The program can dynamically route transactions initiated from user terminals, transactions initiated by eligible terminal-related EXEC CICS START commands, and eligible program-link requests.

DFHDYP, the default, is the name of the CICS-supplied program. For information about which transactions started by EXEC CICS START commands, and which program-link requests, are eligible for dynamic routing, see the the *CICS Intercommunication Guide*.

Note: See also the **DSRTPGM** parameter, used to name the distributed routing program.

DTRTRAN

The **DTRTRAN** system initialization parameter specifies the name of the transaction definition that you want CICS to use for dynamic transaction routing.

DTRTRAN={CRTX|*name*|NO}

This is intended primarily for use in a CICS terminal-owning region, although you can also use it in an application-owning region when you want to daisy-chain transaction routing requests. In a dynamic transaction routing environment, the transaction defined for **DTRTRAN** must be installed in the CICS terminal-owning regions if you want to eliminate the need for resource definitions for individual transactions.

Note: DTRTRAN does not apply to non-terminal **EXEC CICS START** requests where the distributed routing program is invoked.

The transaction name is stored in the catalog for recovery during CICS restarts.

CRTX This is the default dynamic transaction definition. It is the name of the CICS-supplied sample transaction resource definition provided in the CSD group DFHISC.

name The name of your own dynamic transaction resource definition that you want CICS to use for dynamic transaction routing.

NO The dynamic transaction routing program is not invoked when a transaction definition cannot be found.

For information about the CICS-supplied sample transaction resource definition, CRTX, and about defining your own dynamic transaction routing definition, see in the *CICS Intercommunication Guide*.

DUMP

The **DUMP** system initialization parameter specifies whether the CICS dump domain is to take SDUMPs.

DUMP={YES|NO} (active and alternate)

Valid values are as follows:

YES SDUMPs are produced, unless suppressed by the options specified in the CICS system dump table or by the MVS system defaults.

NO SDUMPs are suppressed.

Note: This does not prevent the CICS kernel from taking SDUMPs.

For more information about SDUMPs, see "System dumps" on page 75.

DUMPDS

The **DUMPDS** system initialization parameter specifies the transaction dump data set that is to be opened during CICS initialization.

DUMPDS={AUTO|A|B}
Valid values are as follows:

AUTO
: For all emergency or warm starts, CICS opens the transaction dump data set that was **not** in use when the previous CICS run terminated. This information is obtained from the CICS local catalog.

  If you specify AUTO, or let it default, code DD statements for both of the transaction dump data sets, DFHDMPA and DFHDMPB, in your CICS startup job stream.

A
: CICS opens transaction dump data set DFHDMPA.

B
: CICS opens transaction dump data set DFHDMPB.

DUMPSW

The **DUMPSW** system initialization parameter specifies whether you want CICS to switch automatically to the next dump data set when the first is full.

DUMPSW={NO|NEXT}
Valid values are as follows:

NO
: Disables the CICS autoswitch facility. If the transaction dump data set opened during initialization becomes full, CICS issues a console message to notify the operator. If you want to switch to the alternate data set, you must do so manually using the CEMT or EXEC CICS SET DUMPDS SWITCH command.

NEXT
: Enables the autoswitch facility to switch to the next data set at end of file of the data set opened during initialization. Coding NEXT permits one switch only. If you want to switch to the alternate data set again, you must do so manually using CEMT or EXEC CICS SET DUMPDS SWITCH command. If you specify NEXT, code DD statements for both of the transaction dump data sets, DFHDMPA and DFHDMPB, in your CICS startup job stream.

For more information about transaction dump data sets, see page “Printing the transaction dump data sets” on page 77.

DURETRY

The **DURETRY** system initialization parameter specifies, in seconds, the total time that CICS is to continue trying to obtain a system dump using the SDUMP macro.

DURETRY={30|number-of-seconds|0}
DURETRY allows you to control whether, and for how long, CICS is to reissue the SDUMP macro if another address space in the same MVS system is already taking an SDUMP when CICS issues an SDUMP request.

In the event of an SDUMP failure, CICS responds, depending on the reason for the failure, as follows:

- If MVS is already taking an SDUMP for another address space, and the DURETRY parameter is nonzero, CICS issues an MVS STIMERM macro to wait for five seconds, before retrying the SDUMP. CICS issues a message to say that it is waiting for five seconds before retrying the SDUMP. After five seconds CICS issues another message to say that it is retrying the SDUMP request.

- If the SDUMP fails for any other reason, such as no SYS1.DUMP data sets being available, or I/O errors preventing completion of the dump, CICS issues a message to inform you that the SDUMP has failed, and to give the reason why.

30
: 30 seconds allows CICS to retry up to 6 times (once every 5 seconds), if the cause of failure is that another region is taking an SDUMP.

number-of-seconds
: Code the total number of seconds (up to 32767) during which you want CICS to continue retrying the SDUMP macro if the reason for failure is that another region is taking an SDUMP. CICS retries the SDUMP, once every five seconds, until successful or until retries have been made over a period equal to or greater than the DURETRY value.

0
: Code a zero value if you do not want CICS to retry the SDUMP macro.

ECDSASZE

The **ECDSASZE** system initialization parameter specifies the size of the ECDSA.

ECDSASZE={0K|number}

The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
: Specify number as an amount of storage in the range 0 - 1073741824 bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

  You can specify number in bytes (for example, 4194304), or as a whole number of KBs (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **ECDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.

EDSALIM

The **EDSALIM** system initialization parameter specifies the upper limit of the total amount of storage within which CICS can allocate the individual extended dynamic storage areas (EDSAs) that reside in 31-bit (above-the-line) storage; that is, above 16 MB but below 2 GB.

EDSALIM={48M|*number*}

48M
: The default **EDSALIM** value is 48 MB (50,331,648 bytes).

number
: A value in the range 48 MB to 2047 MB, in multiples of 1 MB. If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify *number* in bytes (for example, 52428800), a whole number of kilobytes (for example, 51200K), or a whole number of megabytes (for example, 50M). See "Coding conventions for DSA limits" in the *CICS Performance Guide*.

From the storage that you specify using **EDSALIM**, CICS allocates the ECDSA, EUDSA, ESDSA, ERDSA, and ETDSA. For information about the contents of each of the extended dynamic storage areas, see "CICS dynamic storage areas" in the *CICS Performance Guide*.

The maximum value that you can specify for **EDSALIM** is limited by the following factors:

- The size that you have specified for the CICS region on the MVS **REGION** parameter in the CICS job or procedure.
- The amount of MVS storage, outside the EDSAs, that you require to satisfy MVS GETMAIN requests for 31-bit (above-the-line) storage.
- The size and location of the CICS internal trace table.

  CICS can obtain 64-bit (above-the-bar) storage, rather than 31-bit (above-the-line) storage for the internal trace table, depending on the version of the z/OS operating system, and whether the CICS region operates with transaction isolation. See CICS facilities that can use 64-bit storage in the Performance Guide.

  If the internal trace table is in 31-bit storage, its size affects your setting for the **EDSALIM** parameter, because the internal trace table requires 31-bit storage outside the EDSA and you must allow for this storage. If the internal trace table is in 64-bit storage, its size does not affect your setting for the **EDSALIM** value. The **TRTABSZ** system initialization parameter specifies the size of the trace table.

For methods to estimate the amount of storage to specify on the **EDSALIM** parameter, see "Estimating and setting EDSALIM" in the *CICS Performance Guide*.

Note: If you change the EDSA limit while CICS is running, the change is cataloged in the local catalog. If **EDSALIM** is specified in the system initialization table, the cataloged value specified by the change overrides the value of the **EDSALIM** system initialization parameter on an initial, cold, or warm start. The cataloged value is not used if you specify **EDSALIM** as a system initialization parameter override (for example, in SYSIN), or if you reinitialize the CICS catalog data sets.

EJBROLEPRFX

The **EJBROLEPRFX** system initialization parameter specifies a prefix that is used to qualify the security role defined in an enterprise bean's deployment descriptor.

EJBROLEPRFX=*ejbrole-prefix*

The prefix is applied to the security role:

- when a role is defined to an external security manager
- when CICS maps a security role to a RACF user ID
- when an application invokes the `isCallerInRole()` method

For more information about how the **EJBROLEPRFX** parameter is used to qualify security roles for enterprise beans, see *Java Applications in CICS*.

You can specify a prefix of up to 16 characters. The prefix must not contain a period (.) character. If you specify a prefix that contains lower case characters, blanks, or punctuation characters, you must enclose it in apostrophes. If the prefix contains an apostrophe, code two successive apostrophes to represent it.

Restrictions:

1. You can specify the **EJBROLEPRFX** parameter in the SIT, PARM, or SYSIN only.
2. The **EJBROLEPRFX** parameter is ignored if security role support is not enabled. To enable security role support you must specify SEC=YES and XEJB=YES.

ENCRYPTION

The **ENCRYPTION** system initialization parameter specifies the cipher suites that CICS uses for secure TCP/IP connections.

ENCRYPTION={STRONG|WEAK|MEDIUM}

When a secure connection is established between a pair of processes, the most secure cipher suite supported by both is used.

- Use ENCRYPTION=STRONG when you can tolerate the overhead of using high encryption if the other system requires it.
- Use ENCRYPTION=WEAK when you want to use encryption up to 40 bits in length.
- Use ENCRYPTION=MEDIUM when you want to use encryption up to 56 bits in length.

For compatibility with previous releases, ENCRYPTION=NORMAL is accepted as an equivalent to ENCRYPTION=MEDIUM. For more information about cipher suites, see Cipher suites in the RACF Security Guide.

CICS can use only the cipher suites which are supported by the underlying z/OS operating system.

EODI

The **EODI** system initialization parameter specifies the end-of-data indicator for input from sequential devices.

EODI={E0|xx}

The characters “xx” represent two hexadecimal digits in the range 01 through FF. The default value is X'E0', which represents the standard EBCDIC backslash symbol (\).

ERDSASZE

The **ERDSASZE** system initialization parameter specifies the size of the ERDSA.

ERDSASZE={0K|number}

The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

Specify number as an amount of storage in the range 0 to 1073741824 bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **ERDSAZSE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.

ESDSASZE

The **ESDSASZE** system initialization parameter specifies the size of the ESDSA.

ESDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 to 1073741824 bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restriction: You can specify the **ESDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.

ESMEXITS

The **ESMEXITS** system initialization parameter specifies whether installation data is to be passed through the RACROUTE interface to the external security manager (ESM) for use in exits written for the ESM.

ESMEXITS={NOINSTLN|INSTLN}
Valid values are as follows:

NOINSTLN
The INSTLN parameter is not used in RACROUTE macros.

INSTLN
CICS-related and installation-supplied data is passed to the ESM using the INSTLN parameter of the RACROUTE macro. For programming information, including the format of the data passed, see the *CICS Customization Guide*. This data is intended for use in exits written for the ESM.

Restrictions You can specify the ESMEXITS parameter in the SIT only.

EUDSASZE

The **EUDSASZE** system initialization parameter specifies the size of the EUDSA.

EUDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 to 1073741824 bytes in multiples of 1048576 bytes (1MB). If the size specified is not a multiple of 1MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the EUDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.

FCT

The **FCT** system initialization parameter specifies the suffix of the file control table to be used.

FCT={NO|xx|YES}
This parameter is effective only on a CICS cold or initial start. CICS does not load an FCT on a warm or emergency restart and all file resource definitions are recovered from the global catalog.

For information about coding the macros for this table, see the *CICS Resource Definition Guide*.

You can use a mixture of macro definitions and RDO definitions for files in your CICS region. However, your FCT should contain definitions for only BDAM files to be loaded on a CICS cold start. Other types of files are loaded from their file definitions in RDO groups specified in the **GRPLIST** system initialization parameter. Any definitions in the FCT other than for BDAM files are ignored.

FCQRONLY

The **FCQRONLY** system initialization parameter specifies whether you want CICS to force all file control requests to run under the CICS QR TCB. This parameter applies to file control requests that access VSAM RLS files and local VSAM LSR files. Requests for all other file types always run on the QR TCB.

FCQRONLY={YES|NO}
Valid values are as follows:

NO File Control requests are treated as threadsafe and are run on an open

TCB to avoid unnecessary TCB switching. For CONCURRENCY(REQUIRED) programs the request runs on an open TCB. For CONCURRENCY(THREADSAFE) programs the request runs on whatever TCB is being used at the time of the request.

YES File control requests are treated as non-threadsafe. CICS forces all file control requests to run under the CICS QR TCB. With all file requests on the QR TCB, CICS can minimize the amount of locking required at the expense of additional TCB switches if requests are run on open TCBs. YES is the default.

For a program defined as CONCURRENCY(REQUIRED), if the file control request is run under the CICS QR TCB, CICS switches back to the open TCB before handing control back to the application program.

For file-owning regions (FORs), choose an appropriate setting for **FCQRONLY**:

- For FORs where the connections to that region are primarily MRO or ISC connections, these requests run on the QR TCB, and CICS runs the mirror program primarily on the QR TCB. Specify **FCQRONLY=YES** so that all file control requests are processed on the QR TCB. This setting improves performance by avoiding locking, which is unnecessary when all file control requests run on the same TCB.
- For FORs where the connections to that region are primarily IPIC connections, these requests run on open TCBs, and CICS runs the mirror program on an L8 open TCB whenever possible. Specify **FCQRONLY=NO** so that file control requests do not switch to the QR TCB to be processed. This setting improves performance by multi-threading file control requests.

FEPI

The **FEPI** system initialization parameter specifies whether or not you want to use the Front End Programming Interface feature (FEPI).

FEPI={NO|YES}

Valid values are as follows:

NO FEPI support is not required. You should specify NO on this parameter (or allow it to default) if you do not have the feature installed, or if you do not require FEPI support.

YES You require FEPI support, and CICS is to start the CSZI transaction.

For information about what is required to run FEPI see the *CICS Front End Programming Interface User's Guide*.

FLDSEP

The **FLDSEP** system initialization parameter specifies one through four field-separator characters, each of which indicates end of field in the terminal input data.

FLDSEP={' '|'xxxx' }

The default is four blanks. The field separator allows you to use transaction identifications of less than four characters followed by one of the separator characters. When less than four characters are coded, the parameter is padded with blanks, so that the blank is then a field separator. None of the specified field separator characters should be part of a transaction identification; in particular, the use of alphabetic characters as field separators is not recommended.

The character specified in the **FLDSEP** parameter must not be the same as any character specified in the **FLDSTRT** parameter. This means that it is invalid to allow both parameters to take the default value. **Restrictions**

If you specify **FLDSEP** in the SIT, the characters must be enclosed in single quotation marks.

If you specify **FLDSEP** as a PARM, SYSIN, or CONSOLE parameter, do **not** enclose the characters in quotation marks, and the characters you choose must not include an embedded blank, or any of these characters:

```
( ) ' = ,
```

FLDSTRT

The **FLDSTRT** system initialization parameter specifies a single character to be the field-name-start character for free-form input for built-in functions.

FLDSTRT={' '|'x'}

The default is a blank. The character specified should not be part of a transaction identification; in particular, the use of alphabetic characters is not recommended.

The character specified in the FLDSTRT parameter must not be the same as any character specified in the FLDSEP parameter. This means that it is invalid to allow both parameters to take the default value.

Restrictions

If you specify FLDSTRT in the SIT, the parameter must be enclosed in single quotation marks.

If you specify FLDSTRT as a PARM, SYSIN, or CONSOLE parameter, do **not** enclose the character in quotation marks, and the character you choose must not be a blank or any of the following characters:

```
( ) ' = ,
```

FORCEQR

The **FORCEQR** system initialization parameter specifies whether you want CICS to force all CICS API user application programs that are specified as threadsafe to run under the CICS QR TCB, as if they were specified as quasi-reentrant programs.

FORCEQR={NO|YES}

This parameter applies to all application programs that are restricted to the current CICS programming interfaces (that is, programs that specify API(CICSAPI)), and does not apply to any of the following programs:

- Java programs that are run in a JVM
- C/C++ programs using XPLINK
- OPENAPI programs
- Programs defined with CONCURRENCY(REQUIRED) |

None of these programs can run on the QR TCB.

NO CICS honors the CONCURRENCY(THREADSAFE) attribute on program resource definitions, and allows user application programs to run on an open TCB to avoid unnecessary TCB switching.

YES CICS forces all CICSAPI user application programs specified with the CONCURRENCY(THREADSAFE) attribute to run under the CICS QR TCB, as if they were specified as CONCURRENCY(QUASIRENT) programs

`FORCEQR=YES` allows you, in a test environment, to run incompletely tested threadsafe application programs that have proved to be non-threadsafe.

The **`FORCEQR`** parameter applies to all programs defined as threadsafe that are not invoked as task-related user exits, global user exits, or user-replaceable modules.

FSSTAFF

The **`FSSTAFF`** system initialization parameter prevents transactions initiated by function-shipped **`EXEC CICS START`** requests being started against incorrect terminals.

`FSSTAFF={YES|NO}`

Specify this parameter in an application-owning region (AOR). You might need to code the function-shipped START affinity (FSSTAFF) parameter in an AOR if all of the following are true:

1. The AOR is connected to two or more terminal-owning regions (TORs) that use the same, or a similar, set of terminal identifiers.
2. One or more of the TORs issues EXEC CICS START requests for transactions in the AOR.
3. The START requests are associated with terminals.
4. You are using shippable terminals, rather than statically defining remote terminals in the AOR.

Consider the following scenario:

Terminal-owning region TOR1 issues an EXEC CICS START request for transaction TRAR, which is owned by region AOR1. It is to be run against terminal T001. Meanwhile, terminal T001 on region TOR2 has been transaction routing to AOR1; a definition of T001 has been shipped to AOR1 from TOR2. When the START request arrives at AOR1, it is shipped to TOR2, rather than TOR1, for transaction routing from terminal T001.

To prevent this situation, code `YES` on the FSSTAFF parameter in the AOR.

YES
When a START request is received from a terminal-owning region, and a shipped definition for the terminal named on the request is already installed in the AOR, the request is always shipped back to a TOR, for routing, *across the link it was received on*, irrespective of the TOR referenced in the remote terminal definition.

If the TOR to which the START request is returned is **not** the one referenced in the installed remote terminal definition, a definition of the terminal is shipped to the AOR, and the autoinstall user program is called. Your autoinstall user program can then allocate an *alias* termid in the AOR, to avoid a conflict with the previously installed remote definition. For information about writing an autoinstall program to control the installation of shipped definitions, see the *CICS Customization Guide*.

NO
When a START request is received from a terminal-owning region, and a shipped definition for the named terminal is already installed in the AOR, the request is shipped to the TOR referenced in the definition, for routing.

Note:

1. FSSTAFF has no effect:

- On statically-defined (hard-coded) remote terminal definitions in the AOR. If you use these, START requests are always shipped to the TORs referenced in the definitions.
- On START requests issued in the local region. It affects only START requests shipped from other regions.
- When coded on intermediate regions in a transaction-routing path. It is effective only when coded on an application-owning region.

2. If the AOR contains no remote definition of a terminal named on a shipped START request, the "terminal not known" global user exits, XICTENF and XALTENF, are called. For details of these exits, see the *CICS Customization Guide*.

FTIMEOUT

The **FTIMEOUT** system initialization parameter specifies a timeout interval for requests made on files that are opened in RLS mode.

FTIMEOUT={30|number}
The timeout interval is in seconds, from 1 through 4080 (sixty eight minutes) and indicates how long VSAM should wait before terminating a request and returning an exception condition.

The default is 30 seconds.

FTIMEOUT applies to transactions that do not have a deadlock timeout interval active. If a time value is specified for the DTIMOUT keyword of the TRANSACTION definition, this value is used as the file timeout value for that transaction.

GMTEXT

The **GMTEXT** system initialization parameter specifies whether the default logon message text (WELCOME TO CICS) or your own message text is to be displayed on the screen.

GMTEXT={'DFHZC2312 * WELCOME TO CICS ***'|'text'}**
The message text can be displayed by the CSGM (good morning) transaction when a terminal is logged on to CICS through z/OS Communications Server, by the CESN transaction if used to sign on to CICS, or by your own transactions using the **EXEC CICS INQUIRE SYSTEM GMMTEXT** command.

You can use apostrophes to punctuate your message, in addition to using them as message delimiters. However, you must code *two* successive apostrophes to represent a single apostrophe in your text. For example,

```
GMTEXT='User''s logon message text.'
```

The whole message must still be enclosed by a pair of single delimiting apostrophes.

Your message text can be from 1 through 246 characters (bytes), and can extend over two lines by extending the text to column 80 on the first line, and continuing in column 1 of the second line. For example, the following might be used in the SYSIN data set:

```
*          CICS Transaction Server for z/OS, Version 4 Release 2 SYSTEM    *
GMTEXT='An Information Development CICS Terminal-Owning Region (TOR) - C
ICSIDC. This message is to show the use of continuation lines when creating a GM
TEXT parameter in the SYSIN data set'  (for first signon
```

The CSGM transaction displays this as follows (with the time appended to the end of message):

```
An Information Development CICS Terminal-Owning Region (TOR) - C
ICSIDC. This message is to show the use of continuation lines when creating a GM
TEXT parameter in the SYSIN data set 09:56:14
```

The CESN transaction displays this as follows:

```
 Signon for CICS Transaction Server for z/OS, Version 4 Release 2 APPLID CICSHTH1

An Information Development CICS Terminal-Owning Region (TOR) - CICSIDC.
This message is to show the use of continuation lines when creating a GMTEXT
parameter in the SYSIN data set
```

For any transaction other than CESN that displays the text specified by this parameter, you must use a TYPETERM with LOGONMSG(YES) for all terminals requiring the logon message. For information about using TYPETERM, see the *CICS Resource Definition Guide*.

GMTRAN

The **GMTRAN** system initialization parameter specifies the name of a transaction ID.

GMTRAN={CSGM|CESN|transaction-id}
Specify the name of the transaction that is:

1. Initiated by ATI when terminals are logged on to CICS by z/OS Communications Server, and LOGONMSG(YES) is specified in the TYPETERM definition.
2. Set to be the next transaction initiated by the terminal operator following expiry of the terminal user's TIMEOUT period (specified in the External Security Manager) and either:
   - LOGONMSG(YES) and SIGNOFF(YES)

     or
   - LOGONMSG(YES), SIGNOFF(LOGOFF) and DISCREQ(NO)

   is specified in the TYPETERM definition.

| GMTRAN is initiated when terminals are logged on to CICS by z/OS Communications Server. Do not specify the name of a remote transaction. The transaction must be capable of being automatically initiated (ATI). The default is the transaction CSGM, that displays the text specified in the GMTEXT parameter. Alternatively, you can specify one of the CICS signon transactions, CESL or CESN, which also display the text specified in the GMTEXT parameter. The GMTRAN parameter can be used with the LGNMSG parameter to retrieve z/OS Communications Server logon data.

GNTRAN

The **GNTRAN** system initialization parameter specifies the transaction that you want CICS to invoke when a user's terminal-timeout period expires.

GNTRAN={NO|transaction_id}
Valid values are as follows:

NO The default value, NO, specifies that no special transaction is to be executed when the timeout period expires. Instead, the user is signed off (subject to the SIGNOFF attribute of the TYPETERM resource definition for the terminal, as described below). After the signoff, if the LOGONMSG(YES) option is specified in the TYPETERM resource definition for the terminal, the transaction specified in the **GMTRAN** system initialization parameter is executed.

transaction_id

The name of a timeout transaction to signoff the user at the timed-out terminal. You can specify CESF as the timeout transaction. Specifying your own transaction allows you to specify functions in addition to, or instead of, signoff. For example, your own transaction could issue a prompt for the terminal user's password, and allow the session to continue if the correct password is entered.

The transaction to be used must have been specially written to handle the GNTRAN COMMAREA that is passed to it. Of the CICS-supplied transactions, only CESF has been written to handle the GNTRAN COMMAREA. For more information about writing your own transactions for GNTRAN, see in the *CICS Customization Guide*.

Note: When either the CICS CESF transaction, or your own transaction, attempts to sign off a terminal, the result is subject to the SIGNOFF attribute of the TYPETERM resource definition for the terminal, as follows:

SIGNOFF	Effect
YES	The terminal is signed off, but not logged off.
NO	The terminal remains signed on and logged on.
LOGOFF	The terminal is both signed off and logged off.

Note: If GNTRAN fails to attach, and SIGNOFF(LOGOFF) has been specified, the terminal which has reached timeout will be signed off and logged off. GNTRAN will not run and will have no effect.

GRNAME

The **GRNAME** system initialization parameter specifies the z/OS Communications Server generic resource name, as 1 through 8 characters, under which a group of CICS terminal-owning regions in a CICSplex register to z/OS Communications Server.

GRNAME=name

There is no default for the **GRNAME** parameter. If you do not specify a value for this parameter, CICS does not register itself with the z/OS Communications Server generic resources function.

Note:

1. If you are operating a CICSplex that comprises separate terminal-owning regions and application-owning regions, ensure that you define a z/OS Communications Server generic resource name to the CICS terminal-owning regions only.
2. Generic resource names must be unique within a single network. A generic resource cannot be identical to:
   - A USERVAR
   - An alias name

- A real LU name

  Note: It is the responsibility of the user to see that these rules are kept.

3. The first character of the **GRNAME** parameter value cannot be a number.

For example, a CICS region with the system initialization parameters:

```
APPLID=CICSHTH1
GRNAME=CICSH###
```

would register to z/OS Communications Server with the applid CICSHTH1 and the generic resource CICSH###. Other LUs in the same sysplex can communicate with the CICS region either through the generic resource or the applid.

However, care should be taken with LU6 connections initiated from this side (such as AUTOCONNECT(YES)) because the bind will now contain the generic resource name and may fail if the partner only knows this region by the applid. Binds initiated from the partner are examined to identify the name by which the partner knows this region (generic resource or applid), thus allowing the appropriate connection to be built. For information about defining connections, see the *CICS Intercommunication Guide*.

GRPLIST

The **GRPLIST** system initialization parameter specifies the names (each 1 - 8 characters) of up to four lists of resource definition groups on the CICS system definition (CSD) file.

GRPLIST={DFHLIST |name|(name[,name2][,name3][,name4])}

The resource definitions in all the groups in the specified lists are loaded during initialization when CICS performs a cold start. If a warm or emergency start is performed, the resource definitions are derived from the global catalog, and the **GRPLIST** parameter is ignored.

Each name can be either a real group list name or a generic group list name that incorporates global filename characters (+ and *). If you specify more than one group list (either by specifically coding two or more group list names or by coding a group list name with global filename characters), the later group lists are concatenated onto the first group list. Any duplicate resource definitions in later group lists override those in earlier group lists.

Use the CEDA command LOCK to protect the lists of resource groups specified on the GRPLIST parameter.

The default is DFHLIST, the CICS-supplied list that specifies the set of resource definitions needed by CICS. If you create your own group list, either add to it the groups specified in DFHLIST (omitting only those for CICS functions that you know you do not need) or specify the DFHLIST name on the **GRPLIST** parameter. Do not code GRPLIST=NO unless you have a group list named NO.

Note:

1. Group lists specified by a generic group list name are concatenated in alphabetic, then numeric, order. For example, the generic list name CICSHT* would concatenate the group lists CICSHT#1, CICSHTAP, CICSHTSD, and CICSHT3V in that order. If the order of concatenation is important (for example, to ensure that a particular resource definition overrides another), consider coding real group list names.
2. If a group list contains resource definitions that are needed by another group list, the group list containing those definitions must be installed first.

For example, if list A has TYPETERM definitions needed for TERMINAL definitions in list B, list A must be installed first. Therefore, you might need to specifically name the prerequisite group on the **GRPLIST** parameter.

3. Take care when using generic group list names, because if a group list on your CSD satisfies the generic name, it will be installed. This means that a group list can be installed more than once; for example, if you specify the real group list name and a generic group list name that it satisfies, or if you specify two generic group list names that the group list name satisfies.
4. To override one or more of the group lists specified on the **GRPLIST** system initialization parameter, you must specify all list names (both real and generic) that you want to use, even if you are not changing the names.

For example, to use the four group lists CICSHT#1, CICSHTAP, CICSHTSD, and CICSHT3V, you could specify either of the following system initialization parameters:

```
GRPLIST=(CICSHT*)
GRPLIST=(CICSHT#1,CICSHTAP,CICSHT3V,CICSHTSD)
```

In the first example, the group lists are loaded in the order CICSHT#1, CICSHTAP, CICSHTSD, then CICSHT3V. Resource definitions installed from the CICSHT3V group list override any duplicate definitions installed by the other groups.

In the second example, the group lists are loaded in the order specified. Resource definitions installed from the CICSHTSD group list override any duplicate definitions installed by the other groups.

If you specify `GRPLIST=(CICSHT#1,CICSAP*,CICSHT3V,CICSHTSD)` and you want to replace the list CICSHT3V with the list ANOLST05, specify the override:

```
GRPLIST=(CICSHT#1,CICSAP*,ANOLST05,CICSHTSD)
```

In general, any required resource definitions should appear in one of the group lists specified on the **GRPLIST** system initialization parameter.

For information about resource definitions, groups, lists, and the CSD, see the *CICS Resource Definition Guide*.

GTFTR

The **GTFTR** system initialization parameter specifies whether CICS can use the MVS generalized trace facility (GTF) as a destination for trace data.

GTFTR={OFF|ON}

This parameter controls whether any of the three types of CICS trace entry are written to GTF data sets. The three types are: CICS system trace (see the SYSTR parameter), user trace (see the USERTR parameter), and exception trace entries (which are always made and not controlled by a system initialization parameter).

OFF	CICS does not use GTF as a destination for CICS trace data.
ON	CICS uses GTF as a destination for CICS trace data. To use the GTF data sets for CICS trace data, you must have started GTF with the USR option, in addition to coding GTFTR=ON.

For information about GTF, see the *z/OS MVS Diagnosis: Tools and Service Aids* manual.

HPO

The **HPO** system initialization parameter specifies whether you want to use the z/OS Communications Server authorized path feature of the high performance option (HPO).

HPO={NO|YES}

If you code YES, the CICS type 6 SVC must be link-edited in your MVS nucleus, and defined to MVS in an SVCPARM statement. If the SVC number is not 215 (the default) you must specify the SVC number on the **SRBSVC** parameter.

For information about installing the CICS type 6 SVC in your MVS system, and about changing the default number, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the HPO parameter in the SIT only.

ICP

The **ICP** system initialization parameter specifies that you want to cold start the interval control program.

ICP=COLD

If COLD is not specified, the ICP start type will be determined by the **START** and **TS** parameter values. If TS=COLD and START=AUTO is specified then Interval Control Elements created without FROM data will be restored on a WARM start. See "Defining CICS resource table and module keywords" on page 117 for further information.

ICV

The **ICV** system initialization parameter specifies the region exit time interval in milliseconds.

ICV={1000|number}

The **ICV** system initialization parameter specifies the maximum time in milliseconds that CICS releases control to the operating system when there are no transactions ready to resume processing. This time interval can be any integer in the range 100 through 3600000 milliseconds (specifying an interval up to 60 minutes). A typical range of operation might be 100 through 2000 milliseconds.

A low value interval can enable much of the CICS nucleus to be retained in dynamic storage, and not be paged-out at times of low terminal activity. This reduces the amount of dynamic storage paging necessary for CICS to process terminal transactions (thus representing a potential reduction in response time), sometimes at the expense of concurrent batch region throughput.

Large networks with high terminal activity are inclined to run CICS without a need for this value, except to handle the occasional, but unpredictable, period of inactivity. These networks can usually function with a large interval (10000 to 3600000 milliseconds). After a task is initiated, the system recognizes its requests for terminal services and the completion of the services, and this maximum delay interval is overridden.

Small systems, or those with low terminal activity, are subject to paging introduced by other jobs running in competition with CICS. By specifying a low value interval, key portions of the CICS nucleus are referenced more frequently, thus reducing the probability of these pages being paged-out. However, the execution of the logic without performing productive work might be considered wasteful. The need to increase the probability of residency by frequent but unproductive referencing must be weighed against the overhead and response time degradation incurred by allowing the paging to occur. By increasing the interval size, less unproductive work is performed at the expense of performance if paging occurs during the periods of CICS activity.

For information about interval control parameters and performance, see the *CICS Performance Guide*.

Note: The region exit time interval process contains a mechanism to ensure that CICS does not constantly set and cancel timers (thus degrading performance) while attempting to meet its objectives for a low region exit time interval. This mechanism can cause CICS to release control to the operating system for up to 0.5 seconds when the interval has been set at less than 250; and up to 0.25 seconds more than the region exit time interval when the interval has been set greater than 250.

ICVR

The **ICVR** system initialization parameter specifies the default runaway task time interval in milliseconds as a decimal number.

ICVR={5000|number}

You can specify zero, or a number in the range 500 through 2 700 000, in multiples of 500. CICS rounds down values that are not multiples of 500. This is the RUNAWAY interval used by transactions defined with RUNAWAY=SYSTEM. See the *CICS Resource Definition Guide* for further information.

CICS may purge a task if it has not given up control after the RUNAWAY interval for the transaction (or ICVR if the transaction definition specified RUNAWAY=SYSTEM). If you code ICVR=0, runaway task control is inoperative for transactions specifying RUNAWAY=SYSTEM in their transaction definition (that is, tasks do not get purged if they appear to be looping). The ICVR value is independent of the ICV value, and can be less than the ICV value. Note that CICS runaway task detection is based upon task time, that is, the interval is decremented only when the task has control of the processor.

For information about commands that reinitialize the ICVR value, see Investigating loops that cause transactions to abend with abend code AICA the *CICS Problem Determination Guide*.

ICVTSD

The **ICVTSD** system initialization parameter specifies the terminal scan delay value.

ICVTSD={500|number}

The terminal scan delay facility determines how quickly CICS deals with some terminal I/O requests made by applications. The range is 0 through 5000 milliseconds, with a default of ICVTSD=500.

There is an overhead in dealing with such requests. By specifying a nonzero value, the overhead may be spread over several transactions. A value close to zero (for example 200) would be adequate.

IIOPLISTENER

The **IIOPLISTENER** system initialization parameter specifies whether the CICS region is to function as an IIOP listener region.

IIOPLISTENER={YES|NO}

Valid values are as follows:

YES	The CICS region is an IIOP listener region, or a combined listener and application owning region (AOR). YES is the default.
NO	The CICS region is an IIOP application owning region, and the *CICS Resource Definition Guide* installed in the region, that specify PROTOCOL(IIOP), cannot be opened.

This parameter has no effect if the region is not an IIOP listener region or an AOR.

For more information about IIOP listener regions and AORs, see *Java Applications in CICS*

INFOCENTER

The **INFOCENTER** system initialization parameter specifies the server name of where the CICS Information Center is installed and the port number that it uses to run in server mode.

INFOCENTER=*servername***:***portnumber*

The port number is specified in the start up script for the information center. The default value is 29127, but you can change it to a suitable number by editing the script file. CICS-supplied transactions with a web browser interface use the value of this parameter to construct links to topics in the information center.

```
INFOCENTER=http://server_name:29127
```

If you do not code this parameter, CICS does not construct links to the information center.

If you add this parameter to the Web User Interface (WUI) CICS startup JCL, a hyperlink labelled **Information Center** is displayed on WUI views and menus. Clicking on this hyperlink opens a new web browser window displaying the CICS Information Center home page.

INITPARM

The **INITPARM** system initialization parameter specifies that parameters are to be passed to application programs that use the **ASSIGN INITPARM** command.

INITPARM=(pgmname_1='parmstring_1'[, ... ,pgmname_n='parmstring_n'])

You can use **INITPARM** to pass parameters to PLTPI programs to be executed in the final stages of system initialization. The area giving access to the parameters is specified by the **ASSIGN INITPARM** command. For programming information about the **ASSIGN INITPARM** command, see the *CICS Application Programming Reference*.

pgmname
The name of a program. This name must be 1 through 8 alphanumeric or national language characters.

parmstring
The parameter string (up to 60 characters enclosed by single quotes) to be passed to the associated program. Any quotes imbedded in the

string must be duplicated. For information on coding INITPARM in the SYSIN data set, see "Rules for coding CICS system initialization parameters in the SYSIN data set" on page 293.

You can specify up to 255 pgmname='parmstring' sets.

Note: You can specify the INITPARM keyword and its parameters more than once, see Sample startup job stream, note 5. If you specify INITPARM multiple times, the final INITPARM parameter specified is the parameter that the system uses. INIPTPARM parameters are not merged, even if you use different pgmname values.

INTTR

The **INTTR** system initialization parameter specifies whether the internal CICS trace destination is to be activated at system initialization.

INTTR={ON|OFF}

This parameter controls whether any of the three types of CICS trace entry are written to the internal trace table. The three types are: CICS system trace (see the SYSTR parameter), user trace (see the USERTR parameter), and exception trace entries (which are always made and not controlled by a system initialization parameter).

ON Activate main storage trace.

OFF Do not activate main storage trace.

IRCSTRT

The **IRCSTRT** system initialization parameter specifies whether IRC is to be started up at system initialization.

IRCSTRT={NO|YES}

If IRCSTRT=YES is not coded, IRC can be initialized by issuing a **SET IRC OPEN** command.

ISC

The **ISC** system initialization parameter specifies whether the CICS programs required for multiregion operation (MRO) and intersystem communication over SNA are to be included.

ISC={NO|YES}

For IPIC interconnectivity (IPIC), specify ISC=YES and TCPIP=YES.

JESDI

The **JESDI** system initialization parameter specifies, in a SIT for an alternate XRF system, the JES delay interval.

JESDI={30|number} (alternate)

The minimum is 5 seconds. The alternate CICS region has to ensure that the active CICS region has been canceled before it can take over the resources owned by the active.

Note: You must give careful consideration to the values you specify for the parameters ADI and JESDI so that they do not conflict with your installation's policy on PR/SM RESETTIME and the XCF INTERVAL and OPNOTIFY intervals. You should ensure that the sum of the interval you specify for ADI plus JESDI exceeds the interval specified by the XCF INTERVAL and the PR/SM policy interval RESETTIME.

JVMCCSIZE

The **JVMCCSIZE** system initialization parameter specifies the size of the shared class cache for pooled JVMs on an initial or cold start of CICS.

JVMCCSIZE={24M|number}
The size of the shared class cache for pooled JVMs can be between 8 MB and 2047 MB. You can specify the number in bytes, or as a whole number of kilobytes followed by the letter K, or as a whole number of megabytes followed by the letter M. The default value is 24 MB (specified as 24M).

You can use the CICS Explorer®, CEMT, or SPI to change the size of the shared class cache while CICS is running. This parameter has no effect on shared class caches for JVM servers.

Warm or emergency CICS starts use the size specified for the shared class cache during the previous CICS execution. The shared class cache normally persists across warm or emergency starts. If you specify the **JVMCCSIZE** system initialization parameter as an override, CICS ignores it.

JVMCCSTART

The **JVMCCSTART** system initialization parameter determines the startup behavior for the shared class cache that is used by pooled JVMs.

JVMCCSTART={AUTO|YES|NO}
The **JVMCCSTART** system initialization parameter controls the behavior of the shared class cache for pooled JVMs. It does not have any effect on shared class caches that are used by JVM servers.

AUTO
Autostart is enabled, so the shared class cache starts as soon as a pooled JVM needs it.

YES
On an initial or cold start, or if the shared class cache did not persist, the startup behavior with JVMCCSTART=YES is the same as the behavior with JVMCCSTART=AUTO.

If you want the shared class cache to start up at CICS initialization, you can write an initialization program (PLTPI program) and define it to CICS in a program list table (PLT) to run immediately after CICS initialization is complete. In the program, use the **PERFORM JVMPOOL** command to manually start one or more pooled JVMs whose profile requires the use of the shared class cache. The shared class cache starts up if it does not already exist.

NO Autostart is disabled, so the shared class cache does not start until you start the class cache manually.

You can change the status of autostart while CICS is running by using the CICS Explorer, CEMT, or SPI. Warm or emergency CICS starts use the setting specified during the previous CICS execution. Because the shared class cache normally persists across warm or emergency starts, if you specify the **JVMCCSTART** system initialization parameter as an override, CICS ignores it. If a shared class cache is active when the region shuts down, it normally persists across a warm or emergency start, except in some circumstances such as an IPL of z/OS. The **JVMCCSTART** setting has no effect in this situation.

JVMxxxxTRACE

The **JVMxxxxTRACE** system initialization parameters specify the default options for pooled JVM tracing.

JVMxxxxTRACE (JVMLEVEL0TRACE=*option*, JVMLEVEL1TRACE=*option*, JVMLEVEL2TRACE=*option*, JVMUSERTRACE=*option*)

Trace levels 29–32 for the SJ component correspond to **JVMLEVEL0TRACE**, **JVMLEVEL1TRACE**, **JVMLEVEL2TRACE** and **JVMUSERTRACE** respectively. To activate pooled JVM tracing, specify level numbers 29–32 on the **SPCTRSJ** or **STNTRSJ** system initialization parameter, or use the CETR transaction.

JVM trace can produce a large amount of output, so activate JVM trace for special transactions, rather than turning it on globally for all transactions.

For definitions of the individual pooled JVM tracing parameters, see "JVMLEVEL0TRACE," "JVMLEVEL1TRACE," "JVMLEVEL2TRACE," and "JVMUSERTRACE" on page 177.

For information about the JVM trace options that you can set using these system initialization parameters, see . There is further information about JVM trace and about problem determination for JVMs in the Java Diagnostics Guide.

Restrictions: You can specify the JVMxxxxTRACE parameters in PARM, SYSIN, or CONSOLE only.

JVMLEVEL0TRACE

The **JVMLEVEL0TRACE** system initialization parameter specifies the default option for pooled JVM Level 0 trace, corresponding to trace level 29 of the SJ component.

JVMLEVEL0TRACE={'ALL(EXCEPTION)'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 0 for pooled JVMs, which is reserved for extraordinary events and errors. Unlike CICS exception trace, which cannot be switched off, the JVM Level 0 trace is usually switched off unless JVM tracing is required. "JVMxxxxTRACE" has more information about these system initialization parameters.

This parameter does not apply to JVM server tracing.

JVMLEVEL1TRACE

The **JVMLEVEL1TRACE** system initialization parameter specifies the default option for pooled JVM Level 1 trace, corresponding to trace level 30 of the SJ component.

JVMLEVEL1TRACE={'ALL(ENTRY,EXIT)'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 1 for pooled JVMs. "JVMxxxxTRACE" has more information about these system initialization parameters.

This parameter does not apply to JVM server tracing.

JVMLEVEL2TRACE

The **JVMLEVEL2TRACE** system initialization parameter specifies the default option for pooled JVM Level 2 trace, corresponding to trace level 31 of the SJ component.

JVMLEVEL2TRACE={'ALL'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 2 for pooled JVMs. The JVM trace point levels go up to level 9. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

| This parameter does not apply to JVM server tracing.

JVMUSERTRACE

The **JVMUSERTRACE** system initialization parameter specifies the default option for JVM user trace, corresponding to trace level 32 of the SJ component.

JVMUSERTRACE={'NONE'|'*user override string***'}**
Use this option for more complex specifications for JVM tracing. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

JVMPROFILEDIR

The **JVMPROFILEDIR** system initialization parameter specifies the name (up to 240 characters long) of a z/OS UNIX directory that contains the JVM profiles for CICS. CICS searches this directory for the profiles it needs to configure JVMs.

JVMPROFILEDIR={/usr/lpp/cicsts/cicsts42/JVMProfiles|*directory***}**

The default value of **JVMPROFILEDIR** is the same as the default value of the USSHOME system initialization parameter, which specifies the name and path of the root directory for CICS files on z/OS UNIX, followed by the subdirectory `JVMProfiles`. Changing the **USSHOME** parameter has no effect on the **JVMPROFILEDIR** parameter value.

If you want CICS to load the JVM profiles from a different directory, you must do one of the following:

- Change the value of the **JVMPROFILEDIR** system initialization parameter.
- Link to your JVM profiles from the directory specified by **JVMPROFILEDIR** using UNIX soft links. Use this method to store your JVM profiles in any place in the z/OS UNIX file system.

| The supplied sample JVM profiles DFHJVMAX, DFHOSGI, DFHJVMPR, and
| DFHJVMCD must always be available to CICS in the directory that is specified
| by **JVMPROFILEDIR**, or linked to using UNIX soft links from that directory.

KEYRING

The **KEYRING** system initialization parameter specifies the fully qualified name of the key ring, within the external security manager's database, that contains the keys and X.509 certificates used by CICS support for the secure sockets layer (SSL) and for Web services security.

KEYRING=*keyring-name*
The maximum length of the **KEYRING** parameter is 47 characters. For more information on creating a key ring file, see in the *CICS RACF Security Guide*

The key ring name is case sensitive.

LGDFINT

The **LGDFINT** system initialization parameter specifies the log defer interval to be used by CICS log manager when determining how long to delay a forced journal write request before invoking the MVS system logger.

LGDFINT={5|*number***}**
The value is specified in milliseconds.

5
: This is the default. When this parameter was first introduced, the default value was 30 milliseconds, but customer experience has shown that 5 is a more realistic value.

number
: number can be any value in the range 0 through 65535. You are recommended to allow **LGDFINT** to assume its default value, 5.

You can modify the log defer interval dynamically using the LOGDEFER option of the **CEMT SET SYSTEM** or **EXEC CICS SET SYSTEM** command. However, you are recommended not to modify this value in a production environment without first performing a system evaluation and performance analysis of any changed value.

If you change the log defer interval value dynamically, the new value is not cataloged. The log defer interval value is taken from the **LGDFINT** system initialization parameter in all types of CICS startup.

When a CICS system has many tasks issuing forced log write requests, these tasks will not be delayed for periods close to the **LGDFINT** parameter value. This is because a forced log write request is normally issued while a log deferral is already being performed for another task. The actual interval might also be affected by the need for tasks to wait across a partition exit.

LGNMSG

The **LGNMSG** system initialization parameter specifies whether z/OS Communications Server logon data is to be made available to an application program.

LGNMSG={NO|YES}
Valid values are as follows:

NO
: z/OS Communications Server logon data is not available to an application program.

YES
: z/OS Communications Server logon data is available to an application program. The data can be retrieved with an EXEC CICS EXTRACT LOGONMSG command. For programming information about this command, see the *CICS Application Programming Reference*.

  You can use this parameter with the **GMTRAN** parameter to retrieve the z/OS Communications Server logon data at the time a terminal is logged on to CICS by z/OS Communications Server.

LLACOPY

The LLACOPY system initialization parameter specifies the situations where CICS uses either the LLACOPY macro or the BLDL macro when locating modules in the DFHRPL or dynamic LIBRARY concatenation.

LLACOPY={YES|NO|NEWCOPY}
Valid values are as follows:

YES
: CICS always uses the LLACOPY macro when locating modules in the DFHRPL or dynamic LIBRARY concatenation.

NO
: CICS always uses the BLDL macro when locating modules in the DFHRPL or dynamic LIBRARY concatenation.

NEWCOPY
: CICS uses the LLACOPY only when a NEWCOPY or a PHASEIN is

being performed. At all other times, CICS uses the BLDL macro when locating modules in the DFHRPL or dynamic LIBRARY concatenation.

Note:

1. If you code LLACOPY=NO or LLACOPY=NEWCOPY you can still benefit from having LLA managed data sets within your DFHRPL or dynamic LIBRARY concatenation. Modules will continue to be loaded from VLF if appropriate.
2. If an LLA managed module has been altered, a BLDL macro may not return the new information and a subsequent load will still return the old copy of the module. To load the new module, an LLACOPY must be issued against that module or a MODIFY LLA,REFRESH command must be issued on a system console.
3. If you set LLACOPY to anything other than NO, ensure that the proper RACF security permissions have been set up first. For more information about this refer to the *CICS RACF Security Guide*.

LOCALCCSID

The **LOCALCCSID** system initialization parameter specifies the default CCSID for the local region.

LOCALCCSID={037|CCSID}

The CCSID is a value of up to 8 characters. If CCSID value is not specified, the default LOCALCCSID is set to 037. For lists of valid CCSIDs, see:

- CICS-supported conversions in the Intercommunication Guide
- Appendix F of the *z/OS Support for Unicode: Using Conversion Services* manual.

037 the default value for LOCALCCSID.

CCSID
represents any other valid CCSID value.

LPA

The **LPA** system initialization parameter specifies whether CICS and user modules can be used from the link pack areas.

LPA={NO|YES}

Valid values are as follows:

NO will not load CICS or user modules from the link pack areas.

YES CICS or usermodules installed in the LPA or in the ELPA can be used from there, instead of being loaded into the CICS region.

A list of the CICS modules that are read-only, and hence eligible for residence in the link pack areas (LPA or ELPA), are contained in the SMP/E USERMOD supplied on the distribution tape in the CICSTS42.CICS.SDFHSAMP, in a member called DFH$UMOD. For details of the CICS system initialization parameter PRVMOD that you can use to override LPA=YES for selected modules, see page PRVMOD.

MAXJVMTCBS

The **MAXJVMTCBS** system initialization parameter specifies the maximum number of open TCBs CICS can create in the pool of J8 and J9 mode TCBs for use by Java programs that run in a JVM (the JVM pool).

MAXJVMTCBS={5|*number*}

You can specify a limit in the range 1 through 999. Within this limit, there are no constraints on how many of the TCBs in the JVM pool are J9 TCBs, and how many are J8 TCBs. The minimum permitted value is 1, meaning that CICS is always able to create at least 1 open TCB for use by a JVM, of either J8 or J9 mode.

JM TCBs, used for management of the shared class cache, do not count towards the MAXJVMTCBS limit.

This parameter does not apply to a JVM server. To change the maximum value of the JVM server, use the **SET JVMSERVER** command.

For more information about managing open TCBs, see System initialization parameters for open TCBs in the CICS Performance Guide.

MAXOPENTCBS

The **MAXOPENTCBS** system initialization parameter specifies the maximum number, in the range 1 through 2000, of open task control blocks (open TCBs) CICS can create in the pool of L8 and L9 mode TCBs.

MAXOPENTCBS={12|*number*}

Within this limit, there are no constraints on how many of the TCBs in the pool are L8 TCBs, and how many are L9 TCBs.

- L9 mode TCBs are used for USERKEY OPENAPI application programs.
- L8 mode TCBs are used in the following circumstances:
  - For CICSKEY OPENAPI application programs.
  - For OPENAPI task-related user exits (TRUEs), for example the CICS-DB2 and WebSphere® MQ Attachment Facilities, and the CICS-DBCTL Database Adapter Transformer (DFHDBAT) when used with IMS Version 12 or later. TRUEs always run in CICSKEY.
  - By CICS itself, because CICS uses OPENAPI CICSKEY programs that run on L8 TCBs when accessing doc templates and HTTP static responses that are stored on z/OS UNIX, or when processing web service requests and parsing XML.

The default value is 12. The minimum permitted value is 1.

Note: If you set the system initialization parameters MAXOPENTCBS=1 and TCPIP=YES, and do not have any TCPIPSERVICEs, issuing a CEDA INSTALL List *(listname)* command where List contains a TCPIPSERVICE causes CEDA to wait on DISPATCH for an OPENTCB. This situation means that CICS does not start.

For more information about managing open TCBs, see System initialization parameters for open TCBs.

MAXSOCKETS

The **MAXSOCKETS** system initialization parameter specifies the maximum number of IP sockets that can be managed by the CICS sockets domain.

MAXSOCKETS={65535|*number*}

Set a suitable value that does not exceed the maximum value as defined in the **MAXFILEPROC** parameter in SYS1.PARMLIB member BPXPRMxx. If you specify a value greater than the **MAXFILEPROC** parameter, CICS issues message DFHSO0124, which specifies the value that CICS has used for this parameter. If the CICS region user ID has superuser authority, the **MAXFILEPROC** parameter does not limit the setting of **MAXSOCKETS**.

The maximum number of sockets must be greater than the maximum number of inbound and outbound sockets used by CICS including the number of TCPIPSERVICE resources in service.

MAXSSLTCBS

The MAXSSLTCBS system initialization parameter specifies the maximum number of S8 TCBs that can run in the SSL pool.

MAXSSLTCBS={8|*number*}
The default is 8, but you can specify up to 1024 TCBs.

This value must not exceed the **MAXTHREADS** and **MAXTHREADTASKS** parameter values, that are specified in SYS1.PARMLIB member BPXPRMxx.

MAXXPTCBS

The **MAXXPTCBS** system initialization parameter specifies the maximum number, in the range 1 through 999, of open X8 and X9 TCBs that can exist concurrently in the CICS region.

MAXXPTCBS={5|*number*}
X8 and X9 are the TCBs that are used to provide XPLink support.

For more information about managing open TCBs, see System initialization parameters for open TCBs.

MCT

The **MCT** system initialization parameter specifies the monitoring control table suffix.

MCT={NO|YES|xx}
If you specify MCT=NO, CICS monitoring builds dynamically a default MCT, ensuring that default monitoring control table entries are always available for use when monitoring is on and a monitoring class (or classes) is active. You can generate an MCT with a single-character suffix only for use by CICS because single-character suffixes cause an error when the MCT is processed by DFHMNDUP. If you use DFHMNDUP, make sure that you create your MCTs with two-character suffixes.

For information about coding the macros for this table, see Generating a performance dictionary record using DFHMNDUP in the Operations and Utilities Guide.

MN

The **MN** system initialization parameter specifies whether monitoring is to be switched on or off at initialization.

MN={OFF|ON}
Use the individual monitoring class system initialization parameters to control which monitoring classes are to be active (see the MNEXC, MNPER, and MNRES parameter descriptions.) The default status is that the CICS monitoring facility is **off**. The monitoring status is recorded in the CICS global catalog for use during warm and emergency restarts.

OFF Switch off monitoring.

ON Switch on monitoring. However, unless at least one individual class is active, no monitoring records are written.

Note:

1. If the monitoring status is ON, CICS accumulates monitoring data continuously. For each monitoring class that is active, CICS writes the monitoring data to a system management facilities (SMF) data set. If the monitoring status is OFF, CICS does not accumulate or write any monitoring data, even if any of the monitoring classes are active.
2. You can change the monitoring status and the monitoring class settings at any time, as follows:
   - During a warm restart by coding system initialization parameters in PARM, SYSIN, or through the system console.
   - While CICS is running, using:
     - The monitoring facility transaction CEMN.
     - The CEMT SET MONITOR command.
     - The EXEC CICS SET MONITOR command.

   When you change the status of monitoring, the change takes effect immediately. If you change the monitoring status from OFF to ON, monitoring starts to accumulate data and write monitoring records to SMF for all tasks that start after the status change is made, for all active monitoring classes. If the status is changed from ON to OFF, monitoring stops writing records immediately and does not accumulate monitoring data for any tasks that start after the status change is made.
3. The monitoring status setting can be manipulated independently of the class settings. This means that, even if the monitoring status is OFF, you can change the monitoring class settings, and the changes take effect for all tasks that are started after the monitoring status is next set to ON.

MNCONV

The **MNCONV** system initialization parameter specifies whether conversational tasks have separate performance class records produced for each pair of terminal control I/O requests.

MNCONV={NO|YES}

Any clock (including user-defined) that is active at the time such a performance class record is produced is stopped immediately before the record is written. After the record is written, such a clock is reset to zero and restarted. Thus a clock whose activity spans more than one recording interval within the conversational task appears in multiple records, each showing part of the time, and the parts add up to the total time that the clock is active. The high watermark fields (which record maximum levels of storage used) are reset to their current values. All other fields are set to X'00', except for the key fields (transid, termid). The monitoring converse status is recorded in the CICS global catalog for use during warm and emergency restarts.

MNEXC

The **MNEXC** system initialization parameter specifies whether the monitoring exception class is to be made active during initialization.

MNEXC={OFF|ON}

The monitoring exception class status is recorded in the CICS global catalog for use during warm and emergency restarts.

OFF	Set the exception monitoring class to “not active”.
ON	Set the exception monitoring class to “active”.

For programming information about exception monitoring records, see the *CICS Customization Guide*.

MNFREQ

The **MNFREQ** system initialization parameter specifies the interval for which CICS automatically produces a transaction performance class record for any long-running transaction.

MNFREQ={0|hhmmss}
The monitoring frequency value is recorded in the CICS global catalog for use during warm and emergency restarts. CICS can produce a performance class monitoring record in this way only when the long-running transaction is running on the QR or CO TCBs.

0 No frequency monitoring is active.

hhmmss
The interval for which monitoring produces automatically a transaction performance class record for any long-running transaction. Specify a 1 to 6 digit number in the range 000100–240000. Numbers that are fewer than six digits are padded with leading zeroes.

MNIDN

The **MNIDN** system initialization parameter specifies whether the monitoring identity class is to be made active during CICS initialization.

MNIDN={OFF|ON}
The monitoring identity class status is recorded in the CICS global catalog for use during warm and emergency restarts.
OFF Set identity monitoring class to not active.
ON Set identity monitoring class to active.

MNPER

The **MNPER** system initialization parameter specifies whether the monitoring performance class is to be made active during CICS initialization.

MNPER={OFF|ON}
The monitoring performance class status is recorded in the CICS global catalog for use during warm and emergency restarts.

OFF Set the performance monitoring class to “not active”.

ON Set the performance monitoring class to active.

For programming information about performance monitoring records, see The CICS monitoring facility in the CICS Performance Guide.

MNRES

The **MNRES** system initialization parameter specifies whether transaction resource monitoring is to be made active during CICS initialization.

MNRES={OFF|ON}
The transaction resource monitoring class status is recorded in the CICS global catalog for use during warm and emergency restarts.
OFF Set transaction resource monitoring to not active.
ON Set transaction resource monitoring to active.

Transaction resource monitoring applies to CICS file resources when you specify the FILE=*nn* option on the DFHMCT TYPE=INTIAL macro.

MNSYNC

The **MNSYNC** system initialization parameter specifies whether you want CICS to produce a transaction performance class record when a transaction takes an implicit or explicit syncpoint (unit-of-work).

MNSYNC={NO|YES}

No action is taken for syncpoint rollbacks. The monitoring syncpoint status is recorded in the CICS global catalog for use during warm and emergency restarts.

MNTIME

The **MNTIME** system initialization parameter specifies whether you want the time stamp fields in the performance class monitoring data to be returned to an application using the **EXEC CICS COLLECT STATISTICS MONITOR(taskno)** command in either GMT or local time.

MNTIME={GMT|LOCAL}

The monitoring time value is recorded in the CICS global catalog for use during warm and emergency restarts.

For programming information on the **EXEC CICS COLLECT STATISTICS** command, see the the *CICS System Programming Reference*.

MQCONN

The **MQCONN** system initialization parameter specifies whether you want CICS to start a connection to WebSphere MQ automatically during initialization.

MQCONN={NO|YES}

NO Do not automatically call DFHMQCOD, the CICS-WebSphere MQ adapter program, during initialization.

YES

Call the CICS-WebSphere MQ adapter program, DFHMQCOD, automatically during CICS initialization. The **MQCONN** parameter always uses program DFHMQCOD to start the CICS-WebSphere MQ connection. It cannot be customized to use a user-supplied attach program of a different name.

When you specify **MQCONN=YES**, the information that CICS needs to start the connection to WebSphere MQ, such as the name of a WebSphere MQ queue manager or queue-sharing group, is taken from the MQCONN resource definition for the CICS region.

An MQCONN resource definition must be installed before CICS can start the connection to WebSphere MQ. When you start the connection automatically at CICS initialization, for an initial or cold start, the MQCONN resource definition must be present in one of the groups named in the list or lists named by the **GRPLIST** system initialization parameter. For a warm or emergency start of CICS, the MQCONN resource definition must have been installed by the end of the previous CICS run.

When you specify **MQCONN=YES**, you do not need to define the CICS-WebSphere MQ adapter program in the CICS post initialization program list table (PLT). For more information about starting and customizing a connection to WebSphere MQ, see The CICS-WebSphere MQ adapter.

MROBTCH

The **MROBTCH** system initialization parameter specifies the number of events that must occur before CICS is posted for dispatch because of the batching mechanism.

MROBTCH={1|number}

The number can be in the range 1 through 255, and the default is 1.

Use this batching mechanism to spread the overhead of dispatching CICS over several tasks. If the value is greater than 1 and CICS is in a system wait, CICS is not posted for dispatch until the specified number of events has occurred. Events include MRO requests from connected systems or DASD I/O and CHANGE_MODE processing. For these events, CICS is dispatched as soon as one of the following occurs:

- The current batch fills up (the number of events equals MROBTCH)
- An ICV interval expires

Therefore, ensure that the time interval you specify in the ICV parameter is low enough to prevent undue delay to the system.

If CICS is dispatched for another reason, the current batch is dealt with in that dispatch of CICS.

Note: During periods of low utilization, a value of MROBTCH greater than 1 might cause increased transaction response times. Transactions that issue file I/O requests might be delayed because of increased FCIOWAIT value. For more information about the effect of MROBTCH on performance, see Batching requests (MROBTCH).

MROFSE

The **MROFSE** system initialization parameter specifies whether you want to extend the lifetime of the long-running mirror to keep it allocated until the end of the task rather than after a user syncpoint for function shipping applications.

MROFSE={NO|YES}

Valid values are as follows:

NO The lifetime of the MRO long-running mirror is not extended.

YES The mirror task remains available to the application until the end of the application's task. This extended long-running mirror saves the overhead of re-attaching the mirror task following a user syncpoint.

This parameter is ignored for DPL requests (that is a DPL causes the session to be freed at the next syncpoint even if is has been kept for a previous sequence of syncpoints).

It should be used with caution especially if DPL requests with SYNCONRETURN or TRANSID are used. For additional information, see the *CICS Intercommunication Guide*

Do not specify this value in the front-end region when long running tasks might be used to function-ship requests. This because a SEND session is unavailable for allocation to other tasks when unused. Specifying MROFSE=YES could prevent the connection from being released when contact has been lost with the back-end region, until the task terminates or issues a function-shipped request.

MROLRM

The **MROLRM** system initialization parameter specifies whether you want to establish an MRO long-running mirror task.

MROLRM={NO|YES}
Valid values are as follows:

NO The MRO long-running mirror task is not required.

YES The mirror transaction remains available to the application issuing the remote request. This long-running mirror saves the overhead of re-establishing communication with the mirror transaction if the application makes more function shipping requests in this unit of work.

For information about long-running mirror tasks, see the *CICS Intercommunication Guide*.

MSGCASE

The **MSGCASE** system initialization parameter specifies how you want the message domains to display mixed case messages.

MSGCASE={MIXED|UPPER}
Messages handled by the CICS message domain and the CPSM message domain are in mixed case.

MIXED
This is the default in the SIT; all messages displayed by the CICS message domain or the CPSM message domain remain in mixed case.

UPPER
The message domain displays all mixed case messages in uppercase only.

Mixed case output is not displayed correctly on Katakana display terminals and printers. Uppercase English characters appear correctly as uppercase English characters, but lowercase appears as Katakana symbols. If you have any Katakana terminals connected to your CICS region, specify MSGCASE=UPPER.

If you want to use uppercase English for your CICS-WebSphere MQ components, you must set MSGCASE=UPPER, and ensure that ASSIGN NATLANGINUSE returns E (US English).

MSGLVL

The **MSGLVL** system initialization parameter specifies the message level that controls the generation of messages to the console and JES message log.

MSGLVL={1|0}
Valid values are as follows:

1 All messages are printed or displayed.
0 Only critical errors or interactive messages are printed or displayed.

MXT

The **MXT** system initialization parameter specifies the maximum number, in the range 1 through 999, of **user** tasks CICS allows to exist at any time.

MXT={5|number}

CICS queues requests for tasks above this number but does not action (attach) them until the number of tasks attached drops below the MXT limit.

Each active IIOP session requires two tasks.

Review the region size specified on the REGION parameter for CICS address spaces. The increase in CICS use of virtual storage above 16 MB (above the line) means that you probably need to increase the REGION parameter.

For CICS regions that operate with transaction isolation, the transaction isolation facility increases the allocation of some virtual storage above 16 MB.

- If the CICS region operates with transaction isolation, CICS allocates storage for task-lifetime storage in multiples of 1 MB for user-key tasks that run above 16 MB. 1 MB is the minimum unit of storage allocation for the extended user dynamic storage area (EUDSA) when transaction isolation is active. However, although storage above 16 MB is allocated in multiples of 1 MB, MVS paging activity affects only the storage that is used (referenced), and unused parts of the 1 MB allocation are not paged.
- If the CICS region operates without transaction isolation, CICS allocates user-key task-lifetime storage above 16 MB in multiples of 64 KB.

The subspace group facility uses more real storage, because MVS creates a page and segment table from real storage for each subspace. The CICS requirement for real storage varies depending on the transaction load at any one time. As a guideline, each task in the system requires 9 KB of real storage, and this should be multiplied by the number of concurrent tasks that can be in the system at any one time (governed by the MXT system initialization parameter).

However, automatic DSA sizing removes the need for accurate storage estimates, with CICS dynamically changing the size of DSAs as demand requires.

Note: The MXT value does **not** include CICS system tasks.

NATLANG

The **NATLANG** system initialization parameter specifies the single-character codes for the languages to be supported in this CICS run.

NATLANG=(E,x,y,z,...)

The codes are listed in Table 14 on page 188.

E	English, which is the *system* default (that is, is provided even if you do not specifically code E).
x,y,z,...	Specify the appropriate letters for the other supported languages that you require.

For the codes that you specify on this parameter, you must ensure that a DFHMET1x module (where x is the language code) is in a library in the STEPLIB DD concatenation of the CICS startup JCL. (For full language support, you must also provide other DFHMEyyx modules.) For information about using the message editing utility to create your own DFHMEyyx modules, see the *CICS Operations and Utilities Guide*.

English language support is provided, even if you do not specifically code E for English.

The first language code specifies the default language for those elements of CICS enabled to receive National Language Support (NLS) messages, such as some destinations used for CICS messages, and the terminals or users not signed-on with an NLS code. The other language codes are provided to specify the language to be used for messages sent to terminals that are defined with the appropriate language support code. For example, coding NATLANG=(F,G,S) has the same effect as coding NATLANG=(F,G,E,S); that is, in both cases the default NLS language is French (F), and the languages English, German (G), and Spanish (S) are supported. (For such support, you would have to create and install the modules DFHMET1F, DFHMET1G, and DFHMET1S into a library in the STEPLIB DD concatenation of the CICS startup JCL.)

NLS is not available to CICS console messages, which continue to be in English only.

Table 14. Languages and codes supported by CICS

NATLANG code	NLS code	Language
A	ENG	Alternative English
Q	ARA	Arabic
1	BEL	Byelorussian
L	BGR	Bulgarian
B	PTB	Brazilian Portuguese
T (Double-Byte Character Set language)	CHT	Traditional Chinese
C (Double-Byte Character Set language)	CHS	Simplified Chinese
2	CSY	Czech
D	DAN	Danish
E	ENU	English
G	DEU	German
O	ELL	Greek
S	ESP	Spanish
W	FIN	Finnish
F	FRA	French
X	HEB	Hebrew
3	HRV	Croatian
4	HUN	Hungarian
J	ISL	Icelandic
I	ITA	Italian
K (Double-Byte Character Set language)	JPN	Japanese
H (Double-Byte Character Set languages)	KOR	Korean
M	MKD	Macedonian
9	NLD	Dutch
N	NOR	Norwegian
5	PLK	Polish
P	PTG	Portuguese
6	ROM	Romanian
R	RUS	Russian
Y	SHC	Serbo-Croatian (Cyrillic)
7	SHL	Serbo-Croatian (Latin)
V	SVE	Swedish
Z	THA	Thai
8	TRK	Turkish

Table 14. Languages and codes supported by CICS (continued)

NATLANG code	NLS code	Language
U	UKR	Ukrainian

Notes:

1. The following language module suffixes are not supported by the message editing utility:
   - E - English master data sets.
   - K - Japanese data sets, where translation is performed by IBM.
   - C - Simplified Chinese data sets, where translation is performed by IBM.
2. The NATLANG code is used as the suffix of the message modules for the associated language.

NCPLDFT

The NCPLDFT system initialization parameter specifies the name of the default named counter pool to be used by the CICS region on calls it makes to a named counter server.

`NCPLDFT={DFHNC001|name}`

If CICS cannot determine, from the named counter options table, the pool name required by an EXEC CICS named counter command, CICS uses the default name specified on the NCPLDFT parameter.

Note: This parameter is relevant to references to a named counter server made through the EXEC CICS API only. It not used by the named counter call interface.

DFHNC001
This is the default name that CICS uses as the named counter pool name if you omit the NCPLDFT system initialization parameter.

name Specifies the 8-character name to be used by CICS as the default pool name in connection with named counter API commands, when the name cannot be resolved by the named counter options table.

NEWSIT

The **`NEWSIT`** system initialization parameter specifies whether CICS is to load the specified SIT, and enforce the use of all system initialization parameters, modified by any system initialization parameters provided by PARM, SYSIN, or the system console, even in a warm start.

`NEWSIT={YES|NO}`

Enforcing the use of system initialization parameters in this way overrides any parameters that may have been stored in a warm keypoint at shutdown.

However, there are some exceptions. The following system initialization parameters are always ignored in a warm start, even if they are supplied by PARM, SYSIN, or the console:

- CSDACC
- CSDBUFND
- CSDBUFNI
- CSDDISP

- CSDDSN
- CSDFRLOG
- CSDINTEG
- CSDJID
- CSDLSRNO
- CSDRECOV
- CSDRLS
- CSDSTRNO
- FCT
- GRPLIST

In a warm restart, CICS uses the **installed** resource definitions saved in the CICS global catalog at warm shutdown, and therefore the CSD, FCT, and GRPLIST parameters are ignored. (At CICS startup, you can only modify installed resource definitions, including file control table entries, or change to a new FCT, by performing a cold start of CICS with START=COLD.)

For more information about the use of the NEWSIT parameter, see "Controlling start and restart" on page 294.

Restrictions

You can specify the NEWSIT parameter in PARM, SYSIN, or CONSOLE only.

NONRLSRECOV

The **NONRLSRECOV** system initialization parameter specifies whether CICS uses the recovery options of the VSAM catalog or the FILE resource for non-RLS files, including the CSD.

NONRLSRECOV={VSAMCAT|FILEDEF}

Recovery options do not apply to read-only files. Valid values are as follows:

VSAMCAT

By default, CICS uses the recovery options that are specified on the VSAM catalog for non-RLS files. These recovery options include the LOG, LOGSTREAMID, and BWO options. If no recovery options are set, CICS uses the attributes on the FILE resource.

FILEDEF

For non-RLS files, including the CSD, CICS ignores any recovery options on the catalog and uses the values specified in the FILE resource instead. The recovery attributes for the CSD are set by the appropriate system initialization parameters.

OFFSITE

The **OFFSITE** system initialization parameter specifies whether CICS is to restart in off-site recovery mode; that is, a restart is taking place at a remote site.

OFFSITE={NO|YES}

For a successful off-site restart, the log records of the failed CICS region must be available at the remote site. CICS does not provide a facility for shipping log records to a remote backup site, but you can use a suitable vendor product to perform this function. See the relevant product documentation for other procedures you need to follow for a remote site restart.

See the *CICS Recovery and Restart Guide* for more information about remote site recovery.

NO CICS will not perform the special restart processing required for remote site recovery.

YES CICS will perform an off-site restart at a remote site following a disaster at the primary site. CICS performs this special processing for an off-site restart, because some information (for example, a VSAM lock structure) is not available at the remote site.

CICS performs an emergency restart, even if the global catalog indicates that CICS can do a warm start. OFFSITE=YES is valid with START=AUTO only, and CICS initialization is terminated if you specify START=COLD or INITIAL.

Restrictions

You can specify the OFFSITE parameter in PARM, SYSIN, or CONSOLE only.

OPERTIM

The OPERTIM system initialization parameter specifies the write-to-operator timeout value, in the range 0 through 86400 seconds (24 hours).

`OPERTIM={120|number}`

This is the maximum time in seconds that CICS waits for a reply before returning control to this transaction. You can change the write-to-operator timeout value when issuing messages to the console from an application by using the timeout option on the **`WRITE OPERATOR`** command. See the *CICS Application Programming Reference* for details.

OPNDLIM

The OPNDLIM system initialization parameter specifies the open destination and close destination request limit.

`OPNDLIM={10|number} (Not required for currently supported releases of z/OS Communications Server.)`

This limit is used to restrict the number of concurrent OPNDSTs and CLSDSTs to prevent the z/OS Communications Server from running out of space in the CICS region. The limit may be any value in the range 0 through 999. When large values are used for OPNDLIM, the value on the EDSALIM system initialization parameter and the value on the MVS REGION parameter may need to be adjusted to ensure that enough operating system storage is available. For information about adjusting these parameters, see the *CICS Performance Guide*.

PARMERR

The **`PARMERR`** system initialization parameter specifies what action you want to follow if CICS detects incorrect system initialization parameter overrides during initialization.

`PARMERR={INTERACT|IGNORE|ABEND}`

When specified as an override, this parameter affects only subsequent system initialization parameter overrides. Errors in earlier system initialization parameter overrides are dealt with according to the **`PARMERR`** system initialization parameter value in the SIT.

INTERACT

Enables the operator to communicate with CICS through the console and correct parameter errors.

Note: INTERACT is overridden with IGNORE in the following cases:

- If errors are found in PARM or SYSIN for system initialization parameter overrides that are not allowed to be entered from the console
- In certain circumstances, in response to invalid data when you have been trying to correct a previous invalid system initialization parameter keyword or value

IGNORE
CICS ignores errors, and tries to complete initialization.

ABEND
CICS abends.

PDI

The PDI system initialization parameter specifies the XRF primary delay interval, in seconds, in a SIT for an active CICS region.

PDI={30|decimal-value}
The minimum delay that you can specify is 5 seconds. This is the time that must elapse between the (apparent) loss of the surveillance signal in the alternate CICS region, and any reaction by the active CICS region. The corresponding parameter for the alternate CICS region is ADI. PDI and ADI need not have the same value.

PDIR

The **PDIR** system initialization parameter specifies a suffix for the PDIR list.

PDIR={NO|YES|xx}
A PDIR is a list of program specification blocks (PSBs) that define, for DL/I, the use of databases by application programs. A PDIR is applicable only if you are using DL/I remote support. See also "The global catalog" on page 294. Specifying a value other than NO implies to CICS that remote DLI support is required.

For information about coding the macros for this table, see the the *CICS Resource Definition Guide*.

PGAICTLG

The PGAICTLG system initialization parameter specifies whether autoinstalled program definitions should be cataloged.

PGAICTLG={MODIFY|NONE|ALL}
While CICS is running, you can set whether autoinstalled programs should be cataloged dynamically, by using either the EXEC CICS SET SYSTEM or CEMT SET SYSTEM command.

MODIFY
Autoinstalled program definitions are cataloged only if the program definition is modified by a SET PROGRAM command subsequent to the autoinstall.

NONE
Autoinstalled program definitions are not cataloged. This gives a faster CICS restart (warm and emergency) compared with the MODIFY or ALL options, because CICS does not reinstall definitions from the global catalog. Definitions are autoinstalled on first reference.

ALL Autoinstalled program definitions are written to the global catalog at the time of the autoinstall, and following any subsequent modification.

PGAIEXIT

The **PGAIEXIT** system initialization parameter specifies the name of the program autoinstall exit program.

PGAIEXIT={<u>DFHPGADX</u>|name}
While CICS is running, you can set the name of the program autoinstall exit program dynamically, by using either the EXEC CICS SET SYSTEM or CEMT SET SYSTEM command.

PGAIPGM

The **PGAIPGM** system initialization parameter specifies the state of the program autoinstall function at initialization.

PGAIPGM={<u>INACTIVE</u>|ACTIVE}
While CICS is running, you can set the status of program autoinstall dynamically, by using either the IBM CICS Explorer or CICSPlex SM Web User Interface.

INACTIVE
The program autoinstall function is disabled.

ACTIVE
The program autoinstall function is enabled.

PGCHAIN

The PGCHAIN system initialization parameter specifies the character string that is identified by terminal control as a BMS terminal page-chaining command.

PGCHAIN=character(s)
The character string can be 1 through 7 characters. For more information about the character string, see "PGRET."

PGCOPY

The **PGCOPY** system initialization parameter specifies the character string that is identified by terminal control as a BMS command to copy output from one terminal to another.

PGCOPY=character(s)
The character string can be 1 through 7 characters. For more information about the character string, see "PGRET."

PGPURGE

The **PGPURGE** system initialization parameter specifies the character string that is identified by terminal control as a BMS terminal page-purge command.

PGPURGE=character(s)
It can be 1 through 7 characters. For more information about the character string, see "PGRET."

PGRET

The **PGRET** system initialization parameter specifies the character string that is recognized by terminal control as a BMS terminal page-retrieval command.

PGRET=character(s)

The character string can be 1 through 7 characters.

1. Each character string is unique with respect to the leading characters of every other transaction identification defined in the CSD. A command requested by a single character precludes the use of all other transaction identifications starting with this character.
2. In pseudoconversational mode, each character string is unique with respect to the leading characters of any terminal input message.
3. A field-separator or other suitable delimiter may be specified in each character string to separate this command code from the remainder of the paging command when entered by an operator. For example:

   ```
   PGCHAIN = X/
   PGCOPY = C/
   PGPURGE = T/
   PGRET = P/
   ```

   This reduces the risk of creating a nonunique command. (See Note 1.)

   Restrictions

   If you specify PGCHAIN, PGCOPY, PGPURGE, or PGRET in the SIT, the characters you choose must not include any of the following: ( ) '

   If you specify PGCHAIN, PGCOPY, PGPURGE, or PGRET as a PARM, SYSIN, or console parameter, do not enclose the characters in quotation marks. The characters you choose must not include an embedded blank or any of the following: ( ) ' =
4. PGCHAIN, PGCOPY, PGPURGE, and PGRET are required only if full function BMS is being used. For information about the BMS page retrieval transaction CSPG, see *CICS Supplied Transactions*.
5. CICS always processes a paging command entered by the operator before initiating a transaction invoked by an EXEC CICS RETURN command with the TRANSID option.

PLTPI

The **PLTPI** system initialization parameter specifies a program list table, which contains a list of programs to be run in the final stages of system initialization.

PLTPI={NO|xx|YES}

For information about coding the macros for the program list table, see *CICS Resource Definition Guide*.

For information about writing initialization programs, see the *CICS Customization Guide*. You can use the **INITPARM** system initialization parameter to pass parameters to those programs.

PLTPISEC

The **PLTPISEC** system initialization parameter specifies whether or not you want CICS to perform command security or resource security checking for PLT programs during CICS initialization.

PLTPISEC={NONE|CMDSEC|RESSEC|ALL}

The PLT programs run under the authority of the userid specified on PLTPIUSR, which must be authorized to the appropriate resources defined by PLTPISEC.

NONE

You do not want any security checking on PLT initialization programs.

CMDSEC
: You want CICS to perform command security checking only.

RESSEC
: You want CICS to perform resource security checking only.

ALL
: You want CICS to perform both command and resource security checking.

Restrictions You can specify the PLTPISEC parameter in the SIT, PARM, or SYSIN only.

PLTPIUSR

The **PLTPIUSR** system initialization parameter specifies the user ID that CICS is to use for security checking for PLT programs that run during CICS initialization.

PLTPIUSR=*userid*

All PLT programs run under the authority of the specified user ID , which must be authorized to all the resources referenced by the programs, as defined by the PLTPISEC parameter.

PLT programs are run under the CICS internal transaction, CPLT. Before the CPLT transaction is attached, CICS performs a surrogate user check against the CICS region userid (the userid under which the CICS region is executing). This is to ensure that the CICS region is authorized as a surrogate for the userid specified on the PLTPIUSR parameter. This ensures that you cannot arbitrarily specify any PLT userid in any CICS region—each PLT userid must first be authorized to the appropriate CICS region.

If you do not specify the PLTPIUSR parameter, CICS runs PLTPI programs under the authority of the CICS region userid, in which case CICS does not perform a surrogate user check. However, the CICS region userid must be authorized to all the resources referenced by the PLT programs.

Restrictions You can specify the PLTPIUSR parameter in the SIT, PARM, or SYSIN only.

PLTSD

The **PLTSD** system initialization parameter specifies a program list table that contains a list of programs to be executed during system termination

PLTSD={NO|xx|YES}

The default value is NO. See “Defining CICS resource table and module keywords” on page 117).

PRGDLAY

The **PRGDLAY** system initialization parameter specifies the BMS purge delay time interval that is added to the specified delivery time to determine when a message is to be considered undeliverable and therefore purged.

PRGDLAY={0|hhmm}

This time interval is specified in the form *hhmm* (where *hh* represents hours from 00 to 99 and *mm* represents minutes from 00 to 59). If **PRGDLAY** is not coded, or is given a zero value, a message remains eligible for delivery either until it is purged or until temporary storage is cold started.

Note: If you specify **PRGDLAY** as a SIT override, you must still specify a 4-character value (for example 0000).

The **PRGDLAY** facility requires the use of full function BMS. Note also that you must code a **PRGDLAY** value if you want the ERRTERM|ERRTERM(name) parameter on **EXEC CICS ROUTE** commands to be operative.

The **PRGDLAY** value determines the interval between terminal page clean-up operations. A very low value causes the CSPQ transaction to be initiated continuously, and can have a detrimental effect on task-related resources. A zero value stops CSPQ initiating terminal page clean-up. However, this can cause messages to stay in the system forever, resulting in performance problems with long AID queues or lack of temporary storage. The actual purge delay time interval specified is dependent on individual system requirements.

PRINT

The **PRINT** system initialization parameter specifies the method of requesting printout of the contents of a 3270 screen.

PRINT={NO|YES|PA1|PA2|PA3}
Valid values are as follows:

NO Screen copying is not required.

YES Screen copying can be requested by terminal control print requests only.

PA1, PA2, or PA3
Screen copying can be requested by terminal control print request, or by using the PA (program attention) key specified.

The PA key specified by this parameter must not be specified by the TASKREQ option of the RDO TRANSACTION definition or be used for 3270 single keystroke retrieval.

When YES, PA1, PA2, or PA3 is specified, transaction CSPP is initiated which invokes program DFHP3270. The transaction and programs are defined in the CSD group DFHHARDC. In the case of 3270 and LUTYPE2 logical units, the resources defined in CSD group DFHVTAMP are required.

The 3270 print-request facility allows either the application program or the terminal operator to request a printout of data currently displayed on the 3270 display.

If CSPP is invoked to print the screen contents at an associated z/OS Communications Server printer, the screen size of the printer is chosen according to the screen size defined in the profile for the transaction CSPP. The CICS-supplied definitions use the default screen size. Therefore, if you want DFHP3270 to use the alternate screen size of the printer, you must alter the screen size defined in the profile for the transaction CSPP. For information about defining profiles for transactions, see the *CICS Resource Definition Guide*.

For a z/OS Communications Server 3270 display without the printer-adapter feature, the PRINT request prints the contents of the display on the first available 3270 printer specified by PRINTER and ALTPRINTER options of the RDO TERMINAL definition. For a printer to be considered available, it must be in service and not currently attached to a task. It is not necessary for the printer to be on the same control unit.

In an MRO environment, the printer must be owned by the same system as the z/OS Communications Server 3270 display.

For the 3275 with the printer-adapter feature, the PRINT request prints the data currently in the 3275 display buffer on the 3284 Model 3 printer attached to the 3275.

The format of the print operation depends on the size of the display buffer. For a 40-character wide display, the print format is a 40-byte line, and for an 80-character wide display the format is an 80-byte line.

For the 3270 compatibility mode logical unit of the 3790 (if the logical unit has the printer-adapter feature specified), the PRINT request prints the contents of the display on the first printer available to the 3790. The allocation of the printer to be used is under the control of the 3790.

For 3274, 3276, and LUTYPE2 logical units with the printer-adapter feature, the PRINT request prints the contents of the display on the first printer available to the 3270 control unit. The printer to be allocated depends on the printer authorization matrix.

For the 3270 compatibility mode logical unit without the printer-adapter feature, see the preceding paragraph on z/OS Communications Server 3270 displays without the printer-adapter feature.

PRTYAGE

The **PRTYAGE** system initialization parameter specifies the number of milliseconds to be used in the priority aging algorithm for incrementing the priority of a task.

PRTYAGE={32768|value}

The value can be in the range 0 through 65535, and 32768 is the default.

The priority aging factor is used to increase the effective priority of a task according to the amount of time it is held on a ready queue. The value represents the number of milliseconds that must elapse before the priority of a waiting task can be adjusted upwards by 1. For example, if you code PRTYAGE=3000, a task has its priority raised by 1 for every 3000 milliseconds it is held on the ready queue. Thus a high value for PRTYAGE results in a task being promoted very slowly up the priority increment range, and a low value enables a task to have its priority incremented quickly.

If you specify a value of 0, the priority aging algorithm is not used (task priorities are not modified by age) and tasks on the ready queue are handled according to the user assigned priority.

PRVMOD

The **PRVMOD** system initialization parameter specifies the names of those modules that are not to be used from the LPA.

PRVMOD={name|(name,name...name)}

The operand is a list of 1-8 character module names. This enables you to use a private version of a CICS nucleus module in the CICS address space, and not a version that might be in the LPA. For information about **PRVMOD**, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **PRVMOD** parameter in PARM, SYSIN, or CONSOLE only.

PSBCHK

The **PSBCHK** system initialization parameter specifies whether CICS is to perform PSB authorization checks for remote terminal users who use transaction routing to initiate a transaction in this CICS region to access an attached IMS system.

PSBCHK={NO|YES}

Valid values are as follows:

NO The remote link is checked, but no check is made against the remote terminal. This is the default.

YES The remote link is checked, and the remote terminal is also checked if RESSEC(YES) is coded in the definition of the transaction in the CSD.

Restrictions You can specify the **PSBCHK** parameter in the SIT, PARM, or SYSIN only.

Note: If you require DL/I security checking, you must specify the XPSB system initialization parameter as XPSB=YES or XSPB=name. For further information about the XPSB system initialization parameter, see XPSB .

PSDINT

The **PSDINT** system initialization parameter specifies the persistent session delay interval, which states if, and for how long, z/OS Communications Server holds sessions in a recovery-pending state.

PSDINT={0|hhmmss}

0 If a failure occurs, z/OS Communications Server sessions are terminated. Zero is the default, and means that persistent sessions support is not exploited.

hhmmss
The time for which z/OS Communications Server retains sessions if a failure occurs, from 1 second up to the maximum of 23 hours 59 minutes and 59 seconds. Specify a 1 to 6-digit time in hours, minutes, and seconds. If you specify fewer than six digits, CICS pads the value with leading zeros. Thus, a value of 500 is taken as 5 minutes exactly.

You can override this value while CICS is running. Overriding the value changes the action taken by z/OS Communications Server if a failure occurs. The changed interval is not stored in the CICS global catalog, and therefore is not restored in an emergency restart.

z/OS Communications Server holds all sessions in a recovery-pending state for up to the interval specified, unless they are unbound through path failure or z/OS Communications Server operator action, or other-system action in the case of intelligent LUs. The interval you specify must be able to cover the time from a CICS failure to the time when the z/OS Communications Server ACB is opened by CICS during a subsequent emergency restart.

- If you specify SNPS (the default) or MNPS for the **PSTYPE** system initialization parameter for the CICS region, set a nonzero value for the persistent session delay interval, so that sessions are retained.
- If you specify NOPS (no persistent sessions support) for the **PSTYPE** system initialization parameter, a zero value is required for the persistent session delay interval.

When choosing your **PSDINT** value, take account of the types and numbers of sessions involved. You must exercise care when specifying large **PSDINT** values because of the problems such a value might give in some environments, in particular:

- Dial up sessions, for which real costs might be incurred.

- LU6.2 sessions to other host systems. If these sessions are retained in recovery pending state, the other host systems might experience excessive queuing delays. This point applies to LU6.1 sessions that are retained until restart, when they are unbound.

PSTYPE

The **PSTYPE** system initialization parameter specifies whether CICS uses z/OS Communications Server single-node persistent sessions (SNPS), multinode persistent sessions (MNPS), or does not use z/OS Communications Server persistent sessions support (NOPS).

PSTYPE={SNPS|MNPS|NOPS}

The default setting, SNPS (single-node persistent sessions), means that persistent sessions support is available, so that z/OS Communications Server sessions can be recovered after a CICS failure and restart. MNPS (multinode persistent sessions) means that, in addition to the SNPS support, z/OS Communications Server sessions can also be recovered after a z/OS Communications Server or z/OS failure in a sysplex (across LPARs).

For single-node persistent sessions support, you require z/OS Communications Server V3.4.1 or later, which supports persistent LU-LU sessions. CICS Transaction Server for z/OS, Version 4 Release 2 functions with releases of z/OS Communications Server earlier than V3.4.1, but in the earlier releases sessions are not retained in a bound state if CICS fails. For multinode persistent sessions support, you require z/OS Communications Server V4.R4 or later, and z/OS Communications Server must be in a Parallel Sysplex® with a coupling facility.

If you specify SNPS or MNPS, set a nonzero value for the **PSDINT** system initialization parameter, which specifies the retention time for session information. The default is zero, which means that sessions are not retained.

If you do not require persistent sessions support, specify NOPS. A CICS region that is used only for development or testing might not require this support. Removing persistent sessions support where it is not required reduces resource consumption, and can enable you to increase the number of CICS regions in an LPAR. If you specify NOPS, a zero value is required for the **PSDINT** system initialization parameter.

PVDELAY

The **PVDELAY** system initialization parameter specifies the persistent verification delay as a value in the range 0 through 10080 minutes (up to 7 days).

PVDELAY={30|number}

PVDELAY defines how long entries can remain in the signed-on-from lists for those connections for which persistent verification is specified in a connection resource definition. If you specify PVDELAY=0, entries are deleted immediately after use.

For information about the use of PVDELAY, see the *CICS Performance Guide*.

QUIESTIM

The **QUIESTIM** system initialization parameter specifies a timeout value for data set quiesce requests.

QUIESTIM={240|number}

In a busy CICSplex, it is possible for the default timeout to expire before the quiesce request has been processed by all the CICS regions, even though there is nothing wrong. If the quiesce operation is not completed when the timeout period expires, SMS VSAM cancels the quiesce. If you find that timeout is occurring too frequently, increase the timeout value.

Specify the timeout value as a number of seconds. The default value is 240 seconds (4 minutes)

The maximum timeout value you can specify is 3600 (1 hour).

RAMAX

The **RAMAX** system initialization parameter specifies the size in bytes of the I/O area allocated for each RECEIVE ANY issued by CICS, in the range 0 through 32767 bytes.

RAMAX={256|number}

If you are using APPC, do not code a value less than 256; otherwise, the results are unpredictable.

For information about coding this parameter, see the *CICS Performance Guide*.

RAPOOL

The **RAPOOL** system initialization parameter specifies the number of concurrent receive-any requests that CICS is to process from the z/OS Communications Server for SNA.

RAPOOL={50|value1|(value1,value2,FORCE)}

value1 is the number of fixed request parameter lists (RPLs), receive any control elements (RACEs), and receive any input areas (RAIAs) that are to be generated whether or not CICS uses the high performance option (HPO). *value1*, in the range 1 through 999, is also the number that are active in a non-HPO system; *value2*, in the range 0 through 999, is the number that are active in an HPO system. The default for *value1* in the DFHSIT macro is 50. The default for *value2* is calculated from *value1* as follows:

```
If value1 = 1, value2 = 1
If value1 ≤ 5, value2 = (value1 minus 1)
If value1 ≥ 6 and ≤ 50, value2 = 5
If value1 > 50, value2 is 10 per cent of value1
```

Note: You should code *value1* equal to or greater than *value2*; if you code *value1* less than *value2*, CICS forces *value2* equal to *value1*.

If you omit the RAPOOL parameter altogether, RAPOOL=(50,5) is assumed. CICS maintains n z/OS Communications Server RECEIVE ANYs, where n is either the RAPOOL “number active” value, or the MXT value minus the number of active tasks, whichever is the smaller. For example, in a non-HPO system:

```
If RAPOOL=2, MXT=50, active tasks = 45 then RECEIVE ANY = 2
If RAPOOL=10, MXT=50, active tasks = 45 then RECEIVE ANY = 5
If RAPOOL=10, MXT=50, active tasks = 35 then RECEIVE ANY = 10
```

or in an HPO system:

```
If RAPOOL=(20,10), MXT=50, active tasks = 45 then RECEIVE ANY = 5
```

FORCE tells CICS to free up Receive_Any_RPLs if they are stalled. CICS decides that the Receive_Any_RPLs are stalled if all the RA RPLs have been posted but the TCTTE for each one is waiting for a response from a z/OS Communications Server terminal or session for 10 dispatches of the TCP (CSTP) task.

This typically happens only if a protocol error has occurred, and sessions are waiting for a response; for example, to a BID SHUTD request from CICS.

Each session is unbound, the Receive_Any data is lost and the RA RPL is reissued thus allowing z/OS Communications Server activity to continue: Message DFHZC4949 is issued for each session affected.

Consider increasing the size of the RAPOOL before resorting to the use of FORCE.

If FORCE is not specified and a Receive_Any stall occurs, DFHZC2118 is written to the console for each session affected.

If FORCE is specified in the SIT, and RAPOOL is supplied as an override, you must again specify FORCE as otherwise it defaults to FORCE not specified.

The number of RECEIVE ANYs needed depends on the expected activity of the system, the average transaction lifetime, and the MAXTASK value specified. For information about coding this parameter, see the Setting the size of the receive-any pool in the CICS Performance Guide.

RDSASZE

The **RDSASZE** system initialization parameter specifies the size of the RDSA.

RDSASZE={0K|number}
The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256 KB). If the size specified is not a multiple of 256 KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the RDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 24-bit**
| **storage (below the line) is specified by the DSALIM system initialization**
| **parameter. You must allow at least 256K for each DSA in 24-bit storage for**
| **which you have not set a size.**

RENTPGM

The **RENTPGM** system initialization parameter specifies whether you want CICS to allocate the read-only DSAs, RDSA and ERDSA, from read-only key-0 protected storage.

RENTPGM={PROTECT|NOPROTECT}
The permitted values are PROTECT (the default), or NOPROTECT:

PROTECT
CICS obtains the storage for the read-only DSAs from key-0 protected storage.

NOPROTECT
CICS obtains the storage from CICS-key storage, effectively creating two more CICS DSAs (CDSA and ECDSA). This allows programs eligible for the read-only DSAs to be modified by programs that execute in CICS key.

You are recommended to specify RENTPGM=NOPROTECT for development regions only, and to specify RENTPGM=PROTECT for production CICS regions.

For more information, see "Storage protection" in the *CICS Performance Guide*.

RESP

The **RESP** system initialization parameter specifies the type of request that CICS terminal control receives from logical units.

RESP={FME|RRN}
Valid values are as follows:

FME Function management end is the default.

RRN Reached recovery node.

RESSEC

The **RESSEC** system initialization parameter specifies whether you want CICS to honor the RESSEC option specified on a transaction's resource definition.

RESSEC={ASIS|ALWAYS}
Valid values are as follows:

ASIS CICS honors the RESSEC option defined in a transaction's resource definition. CICS calls its resource security checking routine only when RESSEC(YES) is specified in a transaction resource definition. This is normally a sufficient level of control, because often you will need only to control the ability to execute a transaction.

ALWAYS
CICS overrides the RESSEC option, and always calls its resource security checking routine to issue the appropriate call to the SAF interface.

Use this option only if you need to control or audit all accesses to CICS resources. Using this option can significantly degrade performance.

Restrictions You can specify the RESSEC parameter in the SIT, PARM, or SYSIN only.

RLS

The **RLS** system initialization parameter specifies whether CICS is to support VSAM record-level sharing (RLS).

RLS={NO|YES}
Valid values are as follows:

NO RLS support is not required in this CICS region. Files whose definitions specify RLSACCESS(YES) will fail to open, with an error indicating that RLS access is not supported. You should not specify RLS=NO if you have files that you want to open in RLS access mode (including the CSD).

YES RLS support is required in this CICS region. During initialization, CICS automatically registers with an SMSVSAM control ACB to enable RLS access to files opened with RLSACCESS(YES).

RLSTOLSR

The **RLSTOLSR** system initialization parameter specifies whether CICS is to include files that are to be opened in RLS mode when calculating the number of buffers, strings, and other resources for an LSR pool.

RLSTOLSR={NO|YES}

CICS performs this calculation only when you have not explicitly defined an LSRPOOL resource definition that corresponds to an LSRPOOLNUM in a file definition. CICS calculates and builds a default LSR pool only when it is opening the first file in LSR mode that references the default pool.

NO CICS is not to include files opened in RLS mode, and which also specify an LSRPOOLNUM, when it is building default LSR pools. Files defined with RLSACCESS(YES) are ignored when CICS is scanning file entries looking for files that specify an LSR pool it is about to build using default values.

If the LSR pools referenced by LSRPOOLNUMs in your file resource definitions are defined explicitly by LSRPOOL resource definitions, you must specify RLSTOLSR=NO.

YES

CICS is to include in its calculation, when building default LSR pools, files that specify both RLSACCESS(YES) and an LSRPOOLNUM.

Note that an LSR pool built including files that are opened in RLS mode is larger than necessary initially. This option is provided to ensure that, if files are later switched to LSR, the LSR pool is adequate for the extra files. You should specify RLSTOLSR=YES only if both of the following conditions are true:

- You do not define LSR pools explicitly, relying instead on CICS obtaining a default set of values for you.
- You have files that are sometimes accessed in RLS mode and sometimes accessed in non-RLS mode (although this is not advised).

The RLSTOLSR parameter is provided to support files that are normally opened in RLS mode, but which can be closed and then switched to LSR mode.

If LSR pools are not defined explicitly using LSRPOOL resource definitions, CICS calculates the resources needed for an LSR pool using default attributes. CICS performs this calculation when opening the first file that specifies an LSR pool that is not explicitly defined. To calculate a default LSR pool, CICS scans all the file entries to count all the files that specify the same LSRPOOLNUM. The size of an LSR pool built dynamically in this way remains fixed until all files that reference the LSR pool are closed. After all files have been closed, another request to open a file with the same LSRPOOLNUM causes CICS to recalculate the size.

If you add files to the system *after* the LSR calculation has been performed there may be insufficient storage available to enable CICS to open a file that specifies a default pool. This situation could occur if files are opened initially in RLS mode and later closed and reopened in LSR mode. There are two ways to ensure that enough resources are built into the LSR pool to support subsequent switches of files from RLS to LSR:

- You can explicitly define LSRPOOL resource definitions that correspond to the LSRPOOLNUMs on file definitions, removing the need for CICS to calculate default values.
- You can specify RLSTOLSR=YES to force CICS to include RLS files when calculating defaults.

RMTRAN

The **RMTRAN** system initialization parameter specifies the name of the transaction that you want an alternate CICS to initiate when logged-on class 1 terminals, which are defined with the attribute RECOVNOTIFY(TRANSACTION) specified, are switched following a takeover.

RMTRAN=({CSGM|name1}[,{CSGM |name2}])

This parameter is applicable only on an alternate CICS region.

If you do not specify a name here, CICS uses the CSGM transaction, the default CICS good morning transaction.

name1 This is the transaction that CICS initiates at terminals that do **not** remain signed-on after the takeover (that is, they are still connected to CICS, but are signed off).

name2 This is the transaction that CICS initiates at terminals that remain signed-on after the takeover. If you specify only name1, CICS uses the CSGM transaction as the default for name2.

If you are using z/OS Communications Server persistent sessions, the name2 transaction is ignored and the name1 transaction is always initiated.

RRMS

The **RRMS** system initialization parameter specifies whether CICS is to register as a resource manager with recoverable resource management services (RRMS).

RRMS={NO|YES}

Valid values are as follows:

NO You do not require RRMS support.

YES You require RRMS support to enable DPL requests to be coordinated by resource recovery services (RRS).

Note: If you specify `RRMS=YES`, ensure that the DFHRXSVC module is available during CICS initialization. This module, which provides RRMS authorized services, is supplied in the SDFHLINK library. For information about this link list library, see the *CICS Transaction Server for z/OS Installation Guide*.

RST

The **RST** system initialization parameter specifies a recoverable service table suffix.

RST={NO|xx|YES}

If you are running CICS with XRF=YES, and you are using DBCTL, you must specify an RST if you want XRF support for DBCTL.

For information about coding the macros for this table, see Recoverable service table (RST) in the Resource Definition Guide.

RSTSIGNOFF

The **RSTSIGNOFF** system initialization parameter specifies whether all users signed-on to the active CICS region are to remain signed-on following a persistent sessions restart or an XRF takeover.

RSTSIGNOFF={NOFORCE|FORCE}

It applies to the following events:

- A persistent sessions restart, where PSDINT=*value* and PSTYPE=SNPS or MNPS are specified, and the restart follows a CICS abnormal or immediate shutdown.
- A persistent sessions restart, where PSDINT=*value* and PSTYPE=MNPS are specified, and terminal sessions are recovered as a result of a z/OS Communications Server restart.
- An XRF takeover, where XRF=YES is specified.

NOFORCE

Do not sign off users, unless FORCE is specified on either:

- The RSTSIGNOFF parameter in the TYPETERM definition referenced by the user's terminal definition.
- The XRFSOFF parameter in the CICS segment of the user's RACF profile.

Thus for a user to remain signed on after a persistent sessions restart or an XRF takeover, NOFORCE must be specified as a system initialization parameter, on the TYPETERM definition, and in the CICS segment.

FORCE

Sign off all users regardless of the options specified on:

- The RSTSIGNOFF attribute in the TYPETERM definition referenced by the user's terminal definition.
- The **XRFSOFF** parameter in the CICS segment of the user's RACF profile.

See the *CICS RACF Security Guide* for information about user profile options in the CICS segment, and see the *CICS Resource Definition Guide* for information about the TYPETERM resource definition.

RSTSIGNTIME

The **RSTSIGNTIME** parameter specifies the timeout delay interval for signon retention during a persistent sessions restart or an XRF takeover.

RSTSIGNTIME={500|decimal-value}

You can specify a 1-to-6 digit time in hours, minutes and seconds, up to the maximum time of 23 hours 59 minutes 59 seconds. If you specify less than six digits, CICS pads the value with leading zeros. Thus a value of 500 is taken as five minutes exactly.

RSTSIGNTIME is counted from the time when CICS failed. Note that the time of failure cannot be determined with complete accuracy.

If you specify NOFORCE on all the appropriate parameters to enable a user to remain signed on, but the persistent sessions restart or XRF takeover takes longer than the specified on the **RSTSIGNTIME** parameter, CICS ensures users do not remain signed on after the delay period expires.

500
Five minutes is the default value.

time
This is the time, in the range 0 through 23 hours 59 minutes 59 seconds, during which CICS permits users to remain signed on during a persistent sessions restart or an XRF takeover. The period is measured as follows:

- For a persistent sessions restart, the period is the time from the CICS failure and the time when the user starts working on the terminal. If the specified time expires before the user starts working on the terminal, users signed on at the time CICS failed are not signed on again after restart.
- For an XRF takeover, the period is the time from when the takeover is initiated to the time at which the alternate CICS has completed takeover and is ready to process user transactions. If the takeover takes longer than the specified period, all users signed on at the time the takeover was initiated are signed off.

A value of 0 means there is no timeout delay, and terminals are not signed on after a persistent sessions restart or XRF takeover, which means that RSTSIGNTIME=0 has the same effect as coding RSTSIGNOFF=FORCE.

When XRF is in use with non-XRF-capable terminals, take into account any AUTCONN delay period when setting the value for RSTSIGNTIME. For example, you might need to increase the time specified on RSTSIGNTIME to allow for the delay up to the start of the CXRE transaction imposed by the AUTCONN parameter; otherwise, terminals could be signed off too early.

RUWAPOOL

The **RUWAPOOL** parameter specifies the option for allocating a storage pool the first time a program invoked by Language Environment runs in a task.

RUWAPOOL={NO|YES}
Valid values are as follows:

NO
CICS disables the option and provides no RUWA storage pool. Every EXEC CICS LINK to a program that runs under Language Environment results in a GETMAIN for RUWA storage.

YES
CICS creates a pool of storage the first time a program invoked by Language Environment runs in a task. This provides an available storage pool that reduces the need to GETMAIN and FREEMAIN run-unit work areas (RUWAs) for every EXEC CICS LINK request.

Note: This applies only to application programs running with the Language Environment run-time option ALL31(ON). RUWAPOOL=YES has no effect on application programs running with the Language Environment run-time option ALL31(OFF).

SDSASZE

The **SDSASZE** system initialization parameter specifies the size of the SDSA.

SDSASZE={0K|number}

The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256 KB). If the size specified is not a multiple of 256 KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **SDSAZSE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 24-bit**
| **storage (below the line) is specified by the DSALIM system initialization**
| **parameter. You must allow at least 256K for each DSA in 24-bit storage for**
| **which you have not set a size.**

SDTRAN

The **SDTRAN** system initialization parameter specifies the name of the shutdown transaction to be started at the beginning of normal and immediate shutdown.

SDTRAN={CESD|name_of_shutdown_tran|NO}

The shutdown transaction enables CICS to shut down in a controlled manner, within a reasonable period of time. For example, you can use it to purge and backout long-running tasks, while ensuring that as many tasks as possible commit or backout cleanly. For information about the CICS-supplied program, DFHCESD, started by the default shutdown transaction, CESD, and how to use it as the basis for your own transaction, see Operations and utilities overview in the Operations and Utilities Guide.

Note:

1. The transaction runs under the userid authority of the issuer of the shutdown command.
2. If the program named by the shutdown transaction cannot be loaded, CICS waits indefinitely for all user tasks to complete. *This happens on an immediate, as well as on a normal, shutdown*.

CESD Starts the CICS-supplied program DFHCESD.

name_of_shutdown_transaction

The 1-to 4-character name of your own shutdown transaction.

NO No shutdown transaction is to be run. On a normal shutdown, CICS waits indefinitely for all user tasks to complete.

SEC

The **SEC** system initialization parameter specifies what level of external security you want CICS to use.

SEC={<u>YES</u>|NO}
Valid values are as follows:

<u>YES</u> You want to use full external security. CICS requires the appropriate level of authorization for the access intent: a minimum of READ permission for read intent, and a minimum of UPDATE permission for update intent.

Note: You must also ensure that the default userid (CICSUSER or another user ID specified on the **DFLTUSER** system initialization parameter) has been defined to RACF.

If command security checking is defined for CICS SP-type commands, then specifying SEC=YES means that the appropriate level of authority is checked for; therefore:

- A check for READ authority is made for **INQUIRE** and **COLLECT** commands.
- A check for UPDATE authority is made for **SET**, **PERFORM**, and **DISCARD** commands.

NO You do not want CICS to use an external security manager. All users have access to all resources, whether determined by attempts to use them or by the **QUERY SECURITY** command. Users are not allowed to sign on or off.

Note: With MRO bind-time security, even if you specify SEC=NO, the CICS region user ID is still sent to the secondary CICS region, and bind-time checking is still carried out in the secondary CICS region. For information about MRO bind-time security, see Security checking using the Query Security command in the RACF Security Guide.

Define whether to use RACF for resource level checking by using the **XDCT**, **XFCT**, **XHFS**, **XJCT**, **XPCT**, **XPPT**, **XPSB**, **XRES**, and **XTST** system initialization parameters. Define whether to use RACF for transaction-attach security checking by using the **XTRAN** system initialization parameter. Define whether to use RACF for enterprise bean method authorization checks by using the "XEJB" on page 241 system initialization parameter. Define whether RACF session security can be used when establishing APPC sessions by using the **XAPPC** system initialization parameter.

For programming information about the use of external security for CICS system commands, see Security checking in CICS System Programming Reference.

Restrictions You can specify the **SEC** parameter in the SIT, PARM, or SYSIN only.

Note: If you are using preset terminal security and you perform a warm start with SEC=NO and then again with SEC=YES, you must reinstall the terminal definition to preserve the preset user ID that is replaced by the default user ID when security is switched off. See Preset terminal security in the RACF Security Guide for details.

SECPRFX

The **SECPRFX** system initialization parameter specifies whether CICS is to prefix the resource names in any authorization requests to the external security manager.

SECPRFX={NO|YES|prefix}
Valid values are as follows:

NO CICS does not use prefixes on any resource names.

YES CICS prefixes all resource names with the CICS region user ID. This is the user ID under which the CICS job runs. It is one of the following:

- If CICS is a batch job, it is the user ID corresponding to the USER parameter of the CICS JOB statement.
- If CICS is a started task, it is the user ID associated with the name of the started procedure in the RACF ICHRIN03 table.
- If CICS is a started job, it is the user ID specified in the user parameter of the STDATA segment of a STARTED general resource class profile.

For more information, see the *CICS RACF Security Guide*.

prefix CICS prefixes all resource names with the string you specify. It can be any string of 1 to 8 upper case alphanumeric characters except NO or YES, and must start with an alphabetic character.

Restrictions You can specify the SECPRFX parameter in the SIT, PARM, or SYSIN only.

The SECPRFX parameter is effective only if you specify YES for the SEC system initialization parameter.

SIT

The **SIT** system initialization parameter specifies the suffix, if any, of the system initialization table that you want CICS to load at the start of initialization.

SIT=xx
If you omit this parameter, CICS loads the unsuffixed table, DFHSIT, which is pregenerated with all the default values. This default SIT (shown in "The default system initialization table" on page 278) is in CICSTS42.CICS.SDFHAUTH, and its source, named DFHSIT$$, is in CICSTS42.CICS.SDFHSAMP.

Restrictions You can specify the system initialization parameter anywhere in PARM or SYSIN, or as the **first** parameter entry at the CONSOLE.

SKRxxxx

The **SKRxxxx** system initialization parameter specifies that a single-keystroke-retrieval operation is required.

SKRxxxx='page-retrieval-command'
| 'xxxx' specifies a key on the 3270 keyboard which, during a page retrieval session, is to be used to represent a page retrieval command. The valid keys you can specify as a system initialization parameter or as an override are PA1 through PA3, and PF1 through PF24. However, if you use full function BMS, you can also define PA25 through PF36. Therefore it is possible to specify up to 39 keys in total.

| The 'page-retrieval-command' value represents any valid page retrieval command, and must be enclosed in apostrophes. It is concatenated to the character string coded in the PGRET parameter. The combined length must not exceed 16 characters.

| **Note:** If full function BMS is used, all PA keys and PF keys are interpreted for
| page retrieval commands, even if some of these keys are not defined.

SNSCOPE

The **SNSCOPE** system initialization parameter specifies whether a userid can be signed on to CICS more than once, within the scope of a single CICS region, a single MVS image, and a sysplex.

SNSCOPE={NONE|CICS|MVSIMAGE|SYSPLEX}

The signon SCOPE is enforced with the MVS ENQ macro where there is a limit on the number of outstanding MVS ENQs per address space. If this limit is exceeded, the MVS ENQ is rejected and CICS is unable to detect if the user is already signed on. When this happens, the signon request is rejected with message DFHCE3587. You can use the ISGADMIN macro to set or reset the MVS ENQ limit. For more information, see the *z/OS MVS Authorized Assembler Services Reference*.

NONE
Each user ID can be used to sign on for any number of sessions on any CICS region. This is the compatibility option, providing the same signon scope as in releases of CICS before CICS Transaction Server for z/OS, Version 4 Release 2.

CICS Each user ID can be signed on once only in the same CICS region. A signon request is rejected if the userid is already signed on to the same CICS region. However, the user ID can be used to signon to another CICS region in the same, or another, MVS image.

MVSIMAGE
Each userid can be signed on once only, and to only one of the set of CICS regions in the same MVS image that also specify SNSCOPE=MVSIMAGE. A signon request is rejected if the user is already signed on to another CICS region in the same MVS image.

SYSPLEX
Each user ID can be signed on once only, and to only one of the set of CICS regions within an MVS sysplex that also specify SNSCOPE=SYSPLEX. A signon is rejected if the user is already signed on to another CICS region in the same MVS sysplex.

The signon scope (if specified) applies to all user IDs signing on by an explicit signon request (for example, by an EXEC CICS SIGNON command or the CESN transaction). SNSCOPE is restricted to users signing on at local terminals, or signing on after using the CRTE transaction to connect to another system.

Signon scope specified by SNSCOPE does not apply to:

- Non-terminal users.
- The CICS default userid, specified by the **DFLTUSER** system initialization parameter.
- Preset user IDs, specified in the USERID option of the **DEFINE TERMINAL** command.
- User IDs for remote users, received in attach headers.
- User IDs for link security. For information about which userid is used for link security on a specific connection, see the *CICS RACF Security Guide*.
- The user ID specified on the **PLTPIUSR** system initialization parameter.
- The CICS region user ID.

Restrictions You can specify the **SNSCOPE** parameter in the SIT, PARM, or SYSIN only.

SPCTR

The **SPCTR** system initialization parameter specifies the level of special tracing required for CICS as a whole.

SPCTRxx={(1,2)|(1[,2][,3])|ALL|OFF}

Specifies the level of special tracing for all CICS components used by a transaction, terminal, or both. If you want to set different tracing levels for an individual component of CICS, use the **SPCTRxx** system initialization parameter.

It is possible to select up to 32 levels of tracing using this parameter. However, most CICS components only use levels 1, 2, and 3, and some do not have trace points at all these levels. The exceptions are the SM component (storage manager domain), which also has level 4 tracing; and the SJ component (JVM domain), which also has trace levels 29-32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. Use the **SPCTRxx** system initialization parameter to set special tracing levels above 3 for these components.

number
The level numbers for the level of special tracing you want for all CICS components.

ALL Enables the special tracing facility for all available levels.

OFF Disables the special tracing facility.

SPCTRxx

The **SPCTRxx** system initialization parameter specifies the level of special tracing for a particular CICS component used by a transaction, terminal, or both.

SPCTRxx={(1,2)|(1[,2][,3][,4][,29][,30][,31][,32])|ALL|OFF}

You identify the component by coding a value for *xx* in the keyword. You code one SPCTRxx keyword for each component you want to define selectively. For a CICS component being specially traced that does not have its trace level set by SPCTRxx, the trace level is that set by **SPCTR** (which, in turn, defaults to (1,2)). The CICS component codes that you can specify for *xx* on the SPCTRxx keyword are shown in the following table:

Code	Component name
AP	Application domain
BA	Business application manager
BF*	Built-in function
BM*	Basic mapping support
BR*	3270 bridge
CP*	Common programming interface
DC*	Dump compatibility layer
DD	Directory manager domain
DH	Document handling domain
DI*	Data interchange
DM	Domain manager domain
DP	Debugging profiles domain

Code	Component name
DS	Dispatcher domain
DU	Dump domain
EC*	Event capture and emission
EI*	Exec interface
EJ	Enterprise Java domain
EM	Event manager domain
EP	Event processing domain
FC*	File control
GC	Global catalog domain
IC*	Interval control
IE	ECI over TCP/IP domain
II	IIOP domain
IS*	ISC or IRC
KC*	Task control
KE	Kernel
LC	Local catalog domain
LD	Loader domain
LG	Log manager domain
LM	Lock domain
ME	Message domain
ML	Markup language domain
MN	Monitoring domain
NQ	Enqueue domain
OT	Object transaction domain
PA	Parameter domain
PC*	Program control
PG	Program manager domain
PI	Pipeline domain
PT	Partner domain
RA	Resource manager adapters
RI*	Resource manager interface (RMI)
RL	Resource life-cycle domain
RM	Recovery manager domain
RS	Region status domain
RX	RRS-coordinated EXCI domain
RZ	Request streams domain
SC*	Storage control
SH	Scheduler services domain
SJ	JVM domain
SM	Storage manager domain
SO	Sockets domain

Code	Component name
ST	Statistics domain
SZ*	Front End Programming Interface
TC*	Terminal control
TD*	Transient data
TI	Timer domain
TR	Trace domain
TS	Temporary storage domain
UE*	User exit interface
US	User domain
WB	Web domain
WU	System management RESTful API
W2	Web 2.0 domain
XM	Transaction manager domain
XS	Security manager domain
Note: 1. Components marked * are subcomponents of the AP domain. The trace entries for these components are produced with a trace point ID of AP *nnnn*. 2. For the DS domain function CHANGE_MODE, a trace entry is generated if DS level 2 or 3 tracing is active.	

number
The level numbers for the level of special tracing you want for the required CICS component. You can use level numbers 1, 2, 3, 4, 29, 30, 31 and 32, depending on the component.

Most CICS components only use levels 1, 2 and 3, and some do not have trace points at all these levels. The exceptions are:

- The SM component (storage manager domain) has level 4 tracing. This level of tracing is intended for IBM field engineering staff.
- The SJ component (JVM domain) has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You can use the system initialization parameters **JVMLEVEL0TRACE**, **JVMLEVEL1TRACE**, **JVMLEVEL2TRACE** and **JVMUSERTRACE** to specify options for these JVM trace levels, and then activate them using the **SPCTRSJ** system initialization parameter.

  When you activate JVM trace, using trace levels 29–32 for the SJ component, the JVM trace appears as CICS trace point SJ 4D02 (when formatted), or SJ 4D01 (if unformatted).

ALL
You want all the available levels of special CICS tracing switched on for the specified component.

OFF
Switches off all levels of special CICS tracing for the CICS component indicated by xx.

For details of using trace, see the *CICS Problem Determination Guide*.

Restrictions You can specify the **SPCTRxx** parameter in PARM, SYSIN, or CONSOLE only.

SPOOL

The **SPOOL** system initialization parameter specifies whether the system spooling interface is required.

SPOOL={NO|YES}

Valid values are as follows:

NO The system spooling interface is not required.

YES The system spooling interface is required.

The CICS spool interface uses the MVS exit, IEFDOIXT, which is provided in the SYS1.LINKLIB library. For further information about the MVS exit IEFDOIXT, see the current z/OS release information on z/OS MVS Installation Exits.

SRBSVC

The **SRBSVC** system initialization parameter specifies the number that you have assigned to the CICS type 6 SVC.

SRBSVC={215|number}

The default number is 215.

For information on changing the SVC number, see the *CICS Transaction Server for z/OS Installation Guide*. A CICS type 6 SVC with the specified (or default) number must have been link-edited with the system nucleus.

SRT

The **SRT** system initialization parameter specifies the system recovery table suffix.

SRT={1$|YES|NO|xx}

If SRT=YES is coded, the default DFHSRT1$ table is used.

Restriction: SRT=YES can only be specified when assembling the SIT table; it cannot be specified as an override parameter.

If SRT=NO is coded, the system recovery program (DFHSRP) does not attempt to recover from a program check or from an operating system abend. However, CICS issues ESPIE macros to intercept program checks to perform cleanup operations before CICS terminates. Therefore, you must provide a SRT if you require recovery from either program checks or abnormal terminations, or both. For information about coding the macros for this table, see the *CICS Resource Definition Guide*

SRVERCP

The **SRVERCP** system initialization parameter specifies the default server code page to be used by the DFHCNV data conversion table but only if the SRVERCP parameter in the DFHCNV macro is set to SYSDEF.

SRVERCP={037|codepage}

The *codepage* is a field of up to 8 characters and can take the values supported by the SRVERCP parameter in the DFHCNV macro. See the *CICS Family: Communicating from CICS on System/390* for the list of valid code pages. The default is *037*.

SSLCACHE

The **SSLCACHE** system initialization parameter specifies whether SSL is to use the local or sysplex caching of session ids.

SSLCACHE={CICS|SYSPLEX}
Sysplex caching is only allowed if multiple CICS socket-owning regions accept SSL connections at the same IP address.

SSLDELAY

The **SSLDELAY** system initialization parameter specifies the length of time in seconds for which CICS retains session ids for secure socket connections.

SSLDELAY={600|*number*}
Session ids are tokens that represent a secure connection between a client and an SSL server.

While the session id is retained by CICS within the SSLDELAY period, CICS can continue to communicate with the client without the significant overhead of an SSL handshake. The value is a number of seconds in the range 0 through 86400.

SSLTCBS

The **SSLTCBS** system initialization parameter is obsolete and is only kept for compatibility.

SSLTCBS={8|*number*}
If it is specified, it is rejected with a message and MAXSSLTCBS is assumed.

START

The **START** system initialization parameter specifies the type of start for the system initialization program.

START=({AUTO|INITIAL|COLD|STANDBY}[,ALL])
The value specified for START, or the default of AUTO, becomes the default value for each resource.

AUTO
CICS performs a warm, emergency, cold or initial start, according to the status of two control records on the global catalog:

- The recovery manager (RM) control record written by the previous execution of CICS
- The RM autostart override record written by a run of the recovery manager utility program, DFHRMUTL

Note: If the global catalog does *not* contain the RM control record:

- If it contains an RM autostart override record with option AUTOINIT, CICS performs an initial start.
- If it does not contain an RM autostart override record with option AUTOINIT, CICS does not start.

If you code START=AUTO, you must do one of the following:

- Provide the global catalog and system log from the previous execution of CICS. For an emergency restart to be successful, you must also have coded an activity keypoint value (see the "AKPFREQ" on page 132 parameter) on the previous execution of CICS.

- Provide a global catalog against which you have run the DFHRMUTL utility program, specifying SET_AUTO_START=AUTOINIT.

You may choose to leave the START parameter set to AUTO for all types of startup other than XRF standby, and use the DFHRMUTL program to reset the startup mode to COLD or INITIAL when necessary, using SET_AUTO_START=AUTOCOLD or SET_AUTO_START=AUTOINIT, respectively. For information about the DFHRMUTL utility program, see Recovery manager utility program (DFHRMUTL) in the Operations and Utilities Guide.

INITIAL

The status of CICS resource definitions saved in the global catalog at the previous shutdown is ignored, and all resource definitions are reinstalled, either from the CSD or CICS control tables.

You should rarely need to specify START=INITIAL; if you want to reinstall definitions of local resources from the CSD, use START=COLD instead.

Examples of times when an initial start is necessary are:

- When bringing up a new CICS system for the first time.
- After a serious software failure, when the system log has been corrupted.
- If the global catalog is cleared or initialized.
- When you want to run CICS with a dummy system log. (If the system log is defined as a dummy, it is ignored.)

COLD

The status of CICS resource definitions saved in the global catalog at the previous shutdown is ignored, and all resource definitions (except those for the system log) are reinstalled, either from the CSD or CICS control tables.

Resynchronization information in the global catalog relating to remote systems or to RMI-connected resource managers is preserved. The CICS system log is scanned during startup, and information regarding unit of work obligations to remote systems, or to non-CICS resource managers (such as DB2) connected through the RMI, is preserved. (That is, any decisions about the outcome of local UOWs, needed to allow remote systems or RMI resource managers to resynchronize their resources, are preserved.)

Note that, on a cold start, the following are *not* preserved:

- Updates to *local* resources that were not fully committed or backed out during the previous execution, *even if the updates were part of a distributed unit of work*.
- Resynchronization information for remote systems connected by LU6.1 links, or for earlier releases of CICS systems connected by MRO.
- Any program LIBRARY definitions that had been dynamically defined. Only the static DFHRPL concatenation will remain, together with any LIBRARY definitions in the grouplist specified at startup or installed via BAS at startup.

If you want to reinstall resource definitions from the CSD, use START=COLD rather than START=INITIAL.

STANDBY

Coding START=STANDBY, but only when you have also specified XRF=YES, defines this CICS as the alternate CICS region in an XRF pair. In other words, you **must** specify START=STANDBY for the system that starts off as the alternate. (To start an active CICS region, specify AUTO or COLD, as you would without XRF.)

(option,ALL)

The ALL option is a special option you can use on the START parameter when you supply it as a system initialization parameter at CICS startup; you cannot code it in the SIT. If you specify START=(AUTO,ALL), CICS initializes all resources according to the type of startup that it selects (warm, emergency, initial, or cold). The ALL option overrides any individual settings in other system initialization parameters.

However, if you do not use the ALL option, you can individually cold start those resources that have a COLD operand. For details of resources that have a COLD option, see “Defining CICS resource table and module keywords” on page 117.

Restrictions You can specify START=(option,ALL) in PARM, SYSIN, or CONSOLE only.

For more information about the types of CICS startup, see “Controlling start and restart” on page 294.

STARTER

The **STARTER** system initialization parameter specifies whether the generation of starter system modules (with $ and # suffixes) is permitted, and various MNOTES are to be suppressed.

STARTER={NO|YES}

This parameter should only be used when service is being performed on starter system modules.

Restrictions You can specify the **STARTER** parameter in the SIT only.

STATEOD

The **STATEOD** system initialization parameter specifies the end-of-day time in the format hhmmss.

STATEOD={0|hhmmss}

The default is 0, which is midnight.

End-of-day time is expressed in local time and must be in the range 00:00:00-23:59:59. That is, the hh value cannot exceed 23, and the mm and ss values can be specified in the range 00 to 59. If you leave out leading zeros, the DFHSIT macro inserts them (for example, 100 becomes 000100—that is, 1 minute 00 seconds past midnight).

This parameter is the equivalent of the ENDOFDAY option on the CEMT and EXEC CICS SET STATISTICS command, which you can use to modify the value set by STATEOD.

STATINT

The **STATINT** system initialization parameter specifies the recording interval for system statistics in the format hhmmss.

STATINT={030000|*hhmmss* }
The default is 3 hours.

The interval must be at least one minute and cannot be more than 24 hours. The minutes and seconds part of the value can be specified in the range 00 to 59. If you leave out leading zeros, the DFHSIT macro inserts them. For example, 3000 becomes 003000 (that is, an interval of 30 minutes).

This parameter is the equivalent of the `INTERVAL` option on the CEMT and **EXEC CICS SET STATISTICS** command, which you can use to modify the value set by STATINT.

STATRCD

The **STATRCD** system initialization parameter specifies the interval statistics recording status at CICS initialization.

STATRCD={OFF|ON}
This status is recorded in the CICS global catalog for use during warm and emergency restarts. Statistics collected are written to the SMF data set.

OFF Interval statistics are not collected (no action is taken at the end of an interval).

End-of-day statistics are collected at the logical end of day and on shutdown. Unsolicited statistics are written to SMF as resources are discarded or closed.

ON Interval statistics are collected.

On a cold start of a CICS region, interval statistics are recorded by default at three-hourly intervals. All intervals are timed using the end-of-day time (midnight is the default) as a base starting time (**not** CICS startup time). This means that the default settings give collections at 00.00, 03.00, 06.00, 09.00, and so on, regardless of the time that you start CICS.

On a warm or emergency restart the statistics recording status is restored from the CICS global catalog.

You can change the statistics recording status at any time as follows:

- During a warm or emergency restart by coding the STATRCD system initialization parameter.
- While CICS is running by using the CEMT or EXEC CICS SET STATISTICS command.

Whatever the value of the STATRCD system initialization parameter, you can ask for requested statistics and requested reset statistics to be collected. You can get statistics “on demand” for all, or for specified, resource types by using the CEMT or EXEC CICS PERFORM STATISTICS command. The period covered for statistics requested in this way is from the last reset time (that is, from the beginning of the current interval or from when you last issued a CEMT or EXEC CICS statistics command specifying RESETNOW) up to the time that you issue the PERFORM STATISTICS command.

For information about using these CEMT commands, see *CICS Supplied Transactions*. For programming information about the EXEC CICS PERFORM commands, see the *CICS System Programming Reference*. For information about the statistics utility program DFHSTUP, or recording statistics in the sample program *hlq*.SAMPLIB, see the *CICS Operations and Utilities Guide*.

STGPROT

The **STGPROT** system initialization parameter specifies whether you want storage protection to operate in the CICS region.

STGPROT={NO|YES}

The permitted values are NO (the default), or YES.

NO If you specify NO, or allow this parameter to default, CICS does not operate any storage protection.

YES If you specify YES, and the required hardware and software support for storage protection is available, CICS operates with storage protection, and observes the storage keys and execution keys that you specify in various system and resource definitions.

If the required hardware and software support for storage protection is not available, CICS issues an information message during initialization, and operates without storage protection.

The **STGPROT** system initialization parameter affects the storage key for the following CICS dynamic storage areas (DSAs):

- UDSA
- SDSA
- EUDSA
- ESDSA

When CICS operates with storage protection, the storage for these DSAs is allocated from user-key storage. When CICS operates without storage protection, the storage for these DSAs is allocated from CICS-key storage.

The **STGPROT** system initialization parameter does not affect the storage key for the following CICS DSAs:

- RDSA. The storage for this DSA is affected by the setting for the **RENTPGM** system initialization parameter.
- ERDSA. The storage for this DSA is affected by the setting for the **RENTPGM** system initialization parameter.
- CDSA. The storage for this DSA is always allocated from CICS-key storage.
- ECDSA. The storage for this DSA is always allocated from CICS-key storage.
- | ETDSA. The storage for this DSA is always allocated from CICS-key storage.
- GCDSA. The storage for this DSA is allocated from CICS-key storage.

For more information, see “Storage protection” and “CICS dynamic storage areas” in the *CICS Performance Guide*.

STGRCVY

The **STGRCVY** system initialization parameter specifies whether CICS should try to recover from a storage violation.

STGRCVY={NO|YES}

Valid values are as follows:

NO CICS does not try to repair any storage violation that it detects.

YES CICS tries to repair any storage violation that it detects.

In both cases, CICS continues unless you have specified in the dump table that CICS should terminate.

In normal operation, CICS sets up four task-lifetime storage subpools for each task. Each element in the subpool starts and ends with a 'check zone' that includes the subpool name. At each freemain, and at end-of-task, CICS checks the check zones and abends the task if either has been overwritten.

Terminal input-output areas (TIOAs) have similar check zones, which are set up with identical values. At each freemain of a TIOA, CICS checks the check zones and abends the task if they are not identical.

If you specify **STGRCVY**(YES), CICS resets the check zones correctly and the task continues running.

If you specify **STGRCVY**(NO), CICS abends the task if it is still running. The storage is not reusable and is not returned to the DSA for the remainder of the CICS cycle. If an error is detected when the task ends, no abend is issued. Any sync point that has taken place could save data that is corrupted.

STNTR

The **STNTR** system initialization parameter specifies the level of standard tracing required for CICS as a whole.

STNTR={1|(1[,2][,3])|ALL|OFF}

It is possible to select up to 32 levels of tracing using the **STNTR** system initialization parameter. However, most CICS components only use levels 1, 2 and 3, and some do not have trace points at all these levels. The exceptions are the SM component (storage manager domain), which also has level 4 tracing; and the SJ component (JVM domain), which also has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You should use the STNTRxx system initialization parameter, rather than the STNTR system initialization parameter, if you need to set standard tracing levels above 3 for these components.

CAUTION:
Before globally activating tracing levels 3 and ALL, which will set these tracing levels for the storage manager (SM) component and the JVM domain (SJ) component, read the warnings given in the description for the STNTRxx system initialization parameter.

number
Code the level number(s) for the level of standard tracing you want for all CICS components. The options are: 1, (1,2), or (1,2,3). The default, 1, specifies standard tracing for level 1 for all CICS components.

ALL Enables standard tracing for all levels.

OFF Disables standard tracing.

For information about the differences between special and standard CICS tracing, see the *CICS Problem Determination Guide*.

STNTRxx

The **STNTRxx** system initialization parameter specifies the level of standard tracing you require for a particular CICS component.

STNTRxx={1|(1[,2][,3][,4][,29][,30][,31][,32])|ALL|OFF}

You identify the component by coding a value for xx in the keyword. You code one STNTRxx keyword for each component you want to define selectively. For a CICS component being specially traced that does not have its trace level set by STNTRxx, the trace level is that set by STNTR (which, in turn, defaults to 1). You can select up to three levels of tracing, but some CICS components do not have trace points at all these levels.

The CICS component codes that you can specify for xx on this STNTRxx keyword are shown in the following table:

Code	Component name
AP	Application domain
BA	Business application manager
BF*	Built-in function
BM*	Basic mapping support
BR*	3270 bridge
CP*	Common programming interface
DC*	Dump compatibility layer
DD	Directory manager domain
DH	Document handling domain
DI*	Data interchange
DM	Domain manager domain
DP	Debugging profiles domain
DS	Dispatcher domain
DU	Dump domain
EC*	Event capture and emission
EI*	Exec interface
EJ	Enterprise Java domain
EM	Event manager domain
EP	Event processing domain
FC*	File control
GC	Global catalog domain
IC*	Interval control
IE	ECI over TCP/IP domain
II	IIOP domain
IS*	ISC or IRC
KC*	Task control
KE	Kernel
LC	Local catalog domain
LD	Loader domain
LG	Log manager domain
LM	Lock domain
ME	Message domain
ML	Markup language domain
MN	Monitoring domain
NQ	Enqueue domain
OT	Object transaction domain
PA	Parameter domain
PC*	Program control
PG	Program manager domain

Code	Component name
PI	Pipeline domain
PT	Partner domain
RA	Resource manager adapters
RI*	Resource manager interface (RMI)
RL	Resource life-cycle domain
RM	Recovery manager domain
RS	Region status domain
RX	RRS-coordinated EXCI domain
RZ	Request streams domain
SC*	Storage control
SH	Scheduler services domain
SJ	JVM domain
SM	Storage manager domain
SO	Sockets domain
ST	Statistics domain
SZ*	Front End Programming Interface
TC*	Terminal control
TD*	Transient data
TI	Timer domain
TR	Trace domain
TS	Temporary storage domain
UE*	User exit interface
US	User domain
WB	Web domain
WU	System management RESTful API
W2	Web 2.0 domain
XM	Transaction manager domain
XS	Security manager domain

Note:

1. Components marked * are subcomponents of the AP domain. The trace entries for these components are produced with a trace point ID of AP *nnnn*.
2. For the DS domain function CHANGE_MODE, a trace entry is generated if DS level 2 or 3 tracing is active.

ALL You want all the available levels of standard tracing switched on for the specified component.

Warning! Selecting ALL for standard tracing for the storage manager (SM) component, or the temporary storage domain (TS), degrades the performance of your CICS region. This is because ALL switches on trace flags that are used by SM domain for field engineering purposes.

Warning! Selecting ALL for standard tracing for the JVM domain (SJ) component is not recommended. JVM trace can produce a large amount of output, so you should normally activate JVM trace for special transactions (using the SPCTRSJ system initialization parameter), rather than turning it on globally for all transactions.

number
The level number(s) for the level of standard tracing you want for the CICS component indicated by xx. Level numbers 1, 2, 3, 4, 29, 30, 31 and 32 can be used, depending on the component.

Most CICS components only use levels 1, 2 and 3, and some do not have trace points at all these levels. The exceptions are:

- The SM component (storage manager domain), which also has level 4 tracing. This level of tracing is intended for IBM field engineering staff.

  Warning! Selecting tracing levels 3, 4, or ALL for standard tracing for the storage manager (SM) component, or the temporary storage domain (TS), degrades the performance of your CICS region. This is because options 3 and 4 (and ALL) switch on trace flags that are used by SM domain for field engineering purposes.

  SM trace flag 3 deactivates the quickcell mechanism, and SM trace flag 4 forces subpool element chaining on every CICS subpool. Furthermore, once these settings have been activated during system initialization, they cannot be unset, either through a PLTPI program or by using the CETR trace transaction, because they are not used for tracing as such. Thus, a significant performance overhead is incurred if these storage manager trace levels are selected for standard tracing.

  See the *CICS Problem Determination Guide* for information about the effects of trace levels 3 and 4.
- The SJ component (JVM domain), which also has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You can use the system initialization parameters JVMLEVEL0TRACE, JVMLEVEL1TRACE, JVMLEVEL2TRACE and JVMUSERTRACE to specify options for these JVM trace levels, and then activate them using the SPCTRSJ system initialization parameter.

  Warning! Selecting tracing levels 29, 30, 31, 32 or ALL for standard tracing for the JVM domain (SJ) component is not recommended. JVM trace can produce a large amount of output, so you should normally activate JVM trace for special transactions (using the SPCTRSJ system initialization parameter), rather than turning it on globally for all transactions.

OFF Switches off all levels of standard CICS tracing for the CICS component indicated by xx.

Restrictions You can specify the STNTRxx parameter in PARM, SYSIN, or CONSOLE only.

SUBTSKS

The **SUBTSKS** system initialization parameter specifies the number of task control blocks (TCBs) you want CICS to use for running tasks in concurrent mode.

SUBTSKS={0|1}
Specifies whether there is to be a concurrent mode TCB so that CICS can perform management functions as system subtasks.

0 If you specify 0 (the default), CICS runs under the following two TCBs:

- The quasi-reentrant mode TCB. CICS runs all user applications under this TCB.
- The resource-owning mode TCB. CICS runs tasks that open and close files under this TCB.

1
: If you specify 1, CICS runs under the two TCBs listed previously, and uses an additional TCB, a concurrent mode TCB, to perform system subtasking.

SUFFIX

The **SUFFIX** system initialization parameter specifies the last two characters of the name of this system initialization table.

SUFFIX=xx

The first 6 characters of the name of the SIT are fixed as DFHSIT. You can specify the last two characters of the name, using the SUFFIX parameter. Because the SIT does not have a TYPE=INITIAL macro statement like other CICS resource control tables, you specify its SUFFIX on the TYPE=CSECT macro statement.

The suffix allows you to have more than one version of the SIT. Any one or two characters (other than NO and DY) are valid. You select the version of the table to be loaded into the system during system initialization by coding SIT=xx, either in the PARM parameter or the SYSIN data set. (You can, in some circumstances, specify the SIT using the system console, but this is not recommended.)

Restrictions You can specify the **SUFFIX** parameter in the SIT only.

SYDUMAX

The **SYDUMAX** system initialization parameter specifies the limit on the number of system dumps that can be taken per dump table entry.

SYDUMAX={999|number}

If this number is exceeded, subsequent system dumps for that particular entry will be suppressed. The **SYDUMAX** parameter applies for new or added system dump codes. It does not override the limit on the number of system dumps for existing dump table entries.

number
: A number in the range 0 through 999. The default, 999, enables an unlimited number of dumps to be taken.

SYSIDNT

The **SYSIDNT** system initialization parameter specifies a 1-4 character name that is known only to your CICS region.

SYSIDNT={CICS|name}

If your CICS region also communicates with other CICS regions, the name you choose for this parameter to identify your local CICS region must not be the same name as an installed CONNECTION resource definition for a remote region.

The value for SYSIDNT, whether specified in the SIT or as an override, can only be updated on a cold start. After a warm start or emergency restart, the value of SYSIDNT is that specified in the last cold start.

For information about the SYSIDNT of a local CICS region, see the *CICS Intercommunication Guide*.

SYSTR

The **SYSTR** system initialization parameter specifies the setting of the master system trace flag.

SYSTR={ON|OFF}
Valid values are as follows:

ON The master trace flag is set, causing CICS to write trace entries of system activity for the individual CICS components. Trace entries are captured and written only for those components for which the trace level is 1 or greater, as specified on the STNTR or STNTRxx system initialization parameters. Entries are written only to those trace destinations that are active.

OFF The master trace flag is unset, and no standard trace entries are captured, overriding any trace levels specified by the STNTR or STNTRxx system initialization parameters.

Note: Setting the master trace flag OFF affects only standard tracing and has no effect on special tracing, which is controlled separately by SPCTR or SPCTRxx trace levels and the CETR transaction.

See the *CICS Problem Determination Guide* for more information about controlling CICS trace.

TAKEOVR

The **TAKEOVR** system initialization parameter specifies the action to be taken by the alternate CICS region, following the apparent loss of the surveillance signal in the active CICS region.

TAKEOVR={MANUAL|AUTO|COMMAND} (alternate)
Use this parameter in the SIT for an alternate CICS region. This parameter also specifies the level of operator involvement.

If both active and alternate CICS regions are running under different MVS images in the same sysplex, and an MVS failure occurs in the MVS image of the active CICS region, the TAKEOVR option is overridden.

- If the MVS images are running in a PR/SM environment, CICS XRF takeover to an alternate CICS region on a separate MVS image completes without the need for any operator intervention.
- If the MVS images are not running in a PR/SM environment, the CICS takeover is still initiated automatically, but needs operator intervention to complete, because XCF outputs a WTOR (IXC402D). Sysplex partitioning does not complete until the operator replies to this message, and CICS waits for sysplex partitioning to complete before completing the XRF takeover.

MANUAL
The operator is asked to approve a takeover if the alternate CICS region cannot detect the surveillance signal of the active CICS region.

The alternate CICS region does not ask the operator for approval if the active CICS region signs off abnormally, or if there is an operator or program command for takeover. In these cases, there is no doubt that the alternate CICS region should take over, and manual involvement by the operator would be an unnecessary overhead in the takeover process.

You could use this option, for instance, to ensure manual takeover of a master or coordinator region in MRO.

AUTO
: No operator approval, or intervention, is needed for a takeover.

COMMAND
: Takeover occurs only when a CEBT PERFORM TAKEOVER command is received by the alternate CICS region. It ensures, for instance, that a dependent alternate CICS region, in MRO, is activated only if it receives the command from the operator, or from a master or coordinator region.

TBEXITS

The **TBEXITS** system initialization parameter specifies the names of your backout exit programs for use during emergency restart backout processing.

TBEXITS=([name1][,name2][,name3] [,name4][,name5][,name6])

The order in which you code the names is significant. If you do not want to use all the exits, code commas in place of the names you omit. For example:

```
TBEXITS=(,,EXITF,EXITV)
```

The program names for *name1* through *name6* apply to global user exit points as follows:

- *name1* and *name2* are the names of programs to be invoked at the XRCINIT and XRCINPT global user exit points (but note that XRCINIT and XRCINPT are invoked only for user log records).
- *name3* is the name of the program to be invoked at the file control backout failure global user exit point, XFCBFAIL.
- *name4* is the name of the program to be invoked at the file control logical delete global user exit point, XFCLDEL.
- *name5* is the name of the program to be invoked at the file control backout override global user exit point, XFCBOVER.
- *name6* is the name of the program to be invoked at the file control backout override global user exit point, XFCBOUT.

This exit is invoked (if required) during backout of a unit of work, regardless of whether the backout is taking place at emergency restart, or at any other time.

The XFCBFAIL, XFCLDEL, and XFCBOVER global user exit programs are enabled on all types of CICS start if they are named on the TBEXITS system initialization parameter.

If no backout exit programs are required, you can do one of the following:

- Omit the **TBEXITS** system initialization parameter altogether
- Code the parameter as TBEXITS=(,,,,,)

TCAM

The **TCAM** system initialization parameter is obsolete and is only kept for compatibility.

TCAM={NO|YES}

If it is specified, it is rejected with a message and TCAM=NO is assumed.

TCP

The **TCP** system initialization parameter specifies whether the pregenerated non-z/OS Communications Server terminal control program, DFHTCP, is to be included.

TCP={<u>YES</u>|NO}
You must code TCP=YES if you intend using card reader/line printer (sequential) devices.

TCPIP

The **TCPIP** system initialization parameter specifies whether CICS TCP/IP services are to be activated at CICS startup.

TCPIP={<u>NO</u>|YES}
The default is NO, meaning that these services cannot be enabled. If TCPIP is set to YES, the IPIC, HTTP, IIOP, and ECI over TCP/IP services can process work.

For IPIC, you must specify TCPIP=YES and ISC=YES.

Note: The TCPIP system initialization parameter affects only CICS internal TCP/IP Services defined by TCPIPSERVICE resource definitions. It has nothing to do with the TCP/IP socket interface for CICS feature of z/OS Communications Server.

TCSACTN

The **TCSACTN** system initialization parameter specifies the required action that CICS terminal control should take if the terminal control shutdown wait threshold expires.

TCSACTN={<u>NONE</u>|UNBIND|FORCE}
For details of the wait threshold, see the **TCSWAIT** system initialization parameter. **TCSACTN** only takes effect when **TCSWAIT** is coded with a value in the range 1 through 99. This is a global default action. On a terminal-by-terminal basis, you can code a DFHZNEP routine to override this action.

<u>NONE</u>
No action is taken. This can be overridden by DFHZNEP.
- To report hung terminals and not attempt to force-close them specify the TCSWAIT=mm (with an appropriate time interval) and TCSACTN=NONE system initialization parameters.
- To attempt to force-close some hung terminals, and only report others, specify the TCSWAIT=mm (with an appropriate time interval) and TCSACTN=NONE system initialization parameters, and code a DFHZNEP routine that selects the required terminals and sets TWAOCN on for them.

UNBIND
CICS terminal control attempts to close the session by issuing a z/OS Communications Server VTAM CLSDST and sending an SNA UNBIND command to the hung terminal. This can be overridden by DFHZNEP.
- To attempt to force-close all hung terminals specify the TCSWAIT=mm (with an appropriate time interval) and TCSACTN=UNBIND system initialization parameters.

FORCE
CICS terminal control attempts to forceclose the CICS z/OS Communications Server ACB if there are any hung terminals or parallel connection sessions. All CICS z/OS Communications Server terminals and sessions are released and CICS normal shutdown

continues. This parameter will only take effect if all LU Type 6.2 parallel connections, if any, have successfully completed CNOS close processing.

- To attempt to force-close the CICS z/OS Communications Server ACB if there are any hung terminals, specify the TCSWAIT=mm (with an appropriate time interval) and TCSACTN=FORCE system initialization parameters.

TCSWAIT

The **TCSWAIT** system initialization parameter specifies the required CICS terminal control shutdown wait threshold.

TCSWAIT={4|number|NO|NONE|0}

The wait threshold is the time, during shutdown, that CICS terminal control allows to pass before it considers terminal shutdown to be hung. If all z/OS Communications Server sessions shutdown and close before the threshold expires then the CICS shutdown process moves on to its next stage, and the terminal control wait threshold then no longer applies. If, however, some of the z/OS Communications Server sessions do not complete shutdown and close, then CICS takes special action with these sessions. For details of this special action see the description of the TCSACTN system initialization parameter. The wait threshold only applies to z/OS Communications Server sessions; that is, z/OS Communications Server terminals and z/OS Communications Server intersystem connections. The wait time is specified as a number of minutes, in the range 1 through 99. As a special case, TCSWAIT=NO may be specified to indicate that terminal control shutdown is never to be considered hung, no matter how long the shutdown and close process takes. TCSWAIT=NONE and TCSWAIT=0 are alternative synonyms for TCSWAIT=NO, and all three have the same effect (internally they are held as the one value 0 (zero)).

The value that you specify on the TCSWAIT system initialization parameter should be large enough so that under normal circumstances all z/OS Communications Server terminals and connections shutdown in an orderly fashion. To help choose this value, consider using a value slightly larger than the elapsed time between the following two CICS terminal control shutdown messages:

```
DFHZC2305 Termination of VTAM sessions beginning
DFHZC2316 VTAM ACB is closed
```

Note: VTAM is now z/OS Communications Server.

TCT

The **TCT** system initialization parameter specifies which terminal control table, if any, is to be loaded.

TCT={NO|xx|YES}

For guidance about coding the macros for this table, see the *CICS Resource Definition Guide*.

If you reassemble the TCT after starting CICS, any changes are applied when you next start CICS, even if it is a warm or emergency startup.

If you have z/OS Communications Server-connected terminals only, you can specify TCT=NO. If you do this, a dummy TCT called DFHTCTDY, is loaded during system initialization. For more information about DFHTCTDY, see “The dummy TCT, DFHTCTDY” on page 287. If you code TCT=NO, you must specify a CSD group list in the **GRPLIST** parameter.

TCTUAKEY

The **TCTUAKEY** system initialization parameter specifies the storage key for the terminal control table user areas (TCTUAs) if you are operating CICS with storage protection (STGPROT=YES).

TCTUAKEY={USER|CICS}
The permitted values are USER (the default), or CICS:

USER CICS obtains the amount of storage for TCTUAs in user key. This allows a user program executing in any key to modify the TCTUA.

CICS CICS obtains the amount of storage in CICS key. This means that only programs executing in CICS key can modify the TCTUA, and user-key programs have read-only access.

If CICS is running without storage protection, the TCTUAKEY parameter only designates which DSA (User or CICS) the storage comes from. The TCTUAs are accessed in CICS-key whether they are in the UDSA or CDSA.

TCTUALOC

The **TCTUALOC** system initialization parameter specifies where terminal user areas (TCTUA) are to be stored.

TCTUALOC={BELOW|ANY}
Valid values are as follows:

BELOW
The TCTUAs are stored below the 16 MB line.

ANY The TCTUAs are stored anywhere in virtual storage. CICS stores TCTUAs above the 16 MB line if possible.

For more information about TCTUAs, see the *CICS Application Programming Guide*.

For details about defining terminals using RDO, see the *CICS Resource Definition Guide*.

TD

The **TD** system initialization parameter specifies the number of VSAM buffers and strings to be used for intrapartition transient data (TD).

TD=({3|decimal-value-1}[,{ 3|decimal-value-2}])
Valid values are as follows:

decimal-value-1
The number of buffers to be allocated for the use of intrapartition transient data. The value must be in the range 1 through 32 767. The default value is 3.

CICS obtains, above the 16 MB line, storage for the TD buffers in units of the page size (4 KB). Because CICS optimizes the use of the storage obtained, TD may allocate more buffers than you specify, depending on the control interval (CI) size you have defined for the intrapartition data set.

For example, if the CI size is 1536, and you specify 3 buffers (the default number), CICS allocates 5 buffers. This is because 2 pages (8192 bytes) are required to obtain sufficient storage for three 1536-byte buffers, a total of only 4608 bytes, which would leave 3584 bytes of spare storage in the second page. In this case, CICS allocates another 2 buffers (3072 bytes) to minimize the amount of unused storage. In this way CICS makes use of storage that would otherwise be unavailable for any other purpose.

decimal-value-2
The number of VSAM strings to be allocated for the use of intrapartition transient data. The value must be in the range 1 through 255, and must not exceed the value specified in decimal-value-1. The default value is 3.

For example, TD=(8,5) specifies 8 buffers and 5 strings.

The operands of the TD parameter are positional. You must code commas to indicate missing operands if others follow. For example, TD=(,2) specifies the number of strings and allows the number of buffers to default.

TDINTRA

The **TDINTRA** system initialization parameter specifies whether CICS is to initialize with empty intrapartition TD queues.

TDINTRA={NOEMPTY|EMPTY}
Valid values are as follows:

NOEMPTY
CICS recovers all the intrapartition TD queues to the state they were in at the previous termination of CICS, as in a normal emergency restart. The TD queue resource definitions are recovered from the CICS global catalog.

EMPTY
CICS initializes with all the intrapartition TD queues empty. This option must be used when CICS is initializing in remote site recovery mode (OFFSITE=YES).

You can optionally use this option to COLD start your intrapartition TD queues to initialize them as empty.

The option is significant only on warm and emergency restarts—cold starts always initialize with empty queues. Note that the EMPTY option may cause data integrity problems because all indoubt log records associated with logically recoverable TD queues are discarded.

The TD queue resource definitions are recovered from the CICS global catalog.

TDSUBTASK

The **TDSUBTASK** system initialization parameter specifies whether CICS should use the FO TCB to write to an extrapartition transient data queue, where the record format is FIXED and the block format is UNBLOCKED.

TDSUBTASK={OFF|ON}
The default is OFF, so that no TCB switch can occur. This particularly benefits you if you are submitting work to JES using the internal reader (INTRDR).

TRANISO

The **TRANISO** system initialization parameter specifies, together with the **STGPROT** system initialization parameter, whether you want transaction isolation in the CICS region.

TRANISO={NO|YES}

The permitted values are NO (the default), or YES.

NO This is the default. If you specify NO, or allow this parameter to default, CICS operates without transaction isolation, and all storage in the CICS address space is addressable. If you specify STGPROT=YES and TRANISO=NO, CICS storage protection is active without transaction isolation.

YES Transaction isolation is required. If you specify TRANISO=YES and STGPROT=YES, and you have the required hardware and software, CICS operates with transaction isolation. This ensures that the user-key task-lifetime storage of transactions defined with the ISOLATE(YES) option is isolated from the user-key programs of other transactions.

If you specify TRANISO=YES, but you do not have the required hardware and software or STGPROT=NO is specified, CICS issues an information message during initialization, and operates without transaction isolation.

If STGPROT=NO and TRANISO=YES are specified in the system initialization table, an error occurs during assembly (MNOTE 8).

Note: VSAM nonshared resources (NSR) are not supported for transactions that use transaction isolation. You should specify ISOLATE(NO) when you define transactions that access VSAM files using NSR. You can also function ship the file request to a remote region. The DFHMIRS program that carries out the request is defined with an EXECKEY of CICS. A CICS-key program has read and write access to CICS-key and user-key storage of its own task and all other tasks, whether or not transaction isolation is active.

For more information, see "Storage protection" in the *CICS Performance Guide*.

| In CICS Transaction Server for z/OS Version 4 Release 2, the **TRANISO** setting might
| affect whether CICS facilities use 64-bit or 31-bit storage. For more information, see
| CICS facilities that can use 64-bit storage in the Performance Guide.

TRAP

The **TRAP** system initialization parameter specifies whether the FE global trap exit is to be activated at system initialization.

TRAP={OFF|ON}

This exit is for diagnostic use under the guidance of service personnel. For background information about this exit, see the *CICS Problem Determination Guide*.

TRDUMAX

The **TRDUMAX** system initialization parameter specifies the limit on the number of transaction dumps that may be taken per Dump Table entry.

TRDUMAX={999|number}

If this number is exceeded, subsequent transaction dumps for that particular entry will be suppressed.

number

A number in the range 0 through 999. The default, 999, enables an unlimited number of dumps to be taken.

TRTABSZ

The **TRTABSZ** system initialization parameter specifies the size, in kilobytes, of the internal trace table.

TRTABSZ={4096| *number-of-kilobytes***}**

4096 4096 KB is the default size of the internal trace table.

number-of-kilobytes
: The number of kilobytes of storage to be allocated for the internal trace table, in the range 16 KB through 1048576 KB (1 GB). The table is page aligned and occupies a whole number of pages. If the value specified is not a multiple of the page size (4 KB), it is rounded up to the next multiple of 4 KB.

Trace entries are of variable lengths. The average length of a trace entry is approximately 100 bytes. 1 KB is equal to 1024 bytes.

The CICS internal trace table is allocated at an early stage during CICS initialization, and it exists for the whole of the CICS run.

CICS obtains a sequence of pages in MVS storage (outside the CICS DSAs) for the internal trace table.

CICS can obtain 64-bit (above-the-bar) storage, rather than 31-bit (above-the-line) storage for the internal trace table, depending on the version of the z/OS operating system, and whether the CICS region operates with transaction isolation. See CICS facilities that can use 64-bit storage in the Performance Guide.

When the internal trace table is in 31-bit storage, subpool 131 is used for the trace table storage.

When the internal trace table is in 31-bit storage, it is allocated before the CICS extended dynamic storage areas (EDSAs). Use caution if you specify a large size for a trace table in 31-bit storage. Ensure that the MVS **REGION** parameter of your CICS job specifies a large enough region size to provide sufficient MVS page storage above the line for the internal trace table and the EDSAs. The **EDSALIM** system initialization parameter specifies the maximum limit for the size of the EDSAs. Use the system command **DISPLAY ASM MVS** to display current information about the status and usage of all MVS page data sets.

When the internal trace table is in 64-bit storage, check your current setting for the z/OS parameter **MEMLIMIT**. **MEMLIMIT** limits the amount of 64-bit storage that the CICS address space can use. Your setting for **TRTABSZ** must remain within **MEMLIMIT**, and you must also allow for other use of 64-bit storage in the CICS region.

For information about the **MEMLIMIT** value for CICS, and instructions to check the value of **MEMLIMIT** that currently applies to the CICS region, see Estimating, checking, and setting MEMLIMIT in the Performance Guide. For further information about **MEMLIMIT** in z/OS, see Limiting the use of memory objects“Limiting the use of memory objects” in the *z/OS MVS Programming: Extended Addressability Guide*.

TRTRANSZ

The **TRTRANSZ** system initialization parameter specifies the size, in kilobytes, of the transaction dump trace table.

TRTRANSZ={16 | *number-of-kilobytes***}**

| When a transaction dump is taken, CICS obtains MVS storage in 64-bit
| (above-the-bar) storage for the transaction dump trace table.

16 16 KB is the default size of the transaction dump trace table.

number-of-kilobytes
The number of kilobytes of storage to be allocated for the transaction dump trace table, in the range 16 -1048576 KB (1 GB).

Trace entries are of variable lengths. The average length of a trace entry is approximately 100 bytes. 1 KB is equal to 1024 bytes.

When you set this parameter, check your current setting for the z/OS parameter **MEMLIMIT**. **MEMLIMIT** limits the amount of 64-bit storage that the CICS address space can use. Your setting for **TRTRANSZ** must remain within **MEMLIMIT**, and you must also allow for other facilities in the CICS region that use 64-bit storage. See Estimating, checking, and setting MEMLIMIT in the Performance Guide. For information about **MEMLIMIT** in z/OS, see "Limiting the use of memory objects" in the *z/OS MVS Programming: Extended Addressability Guide*.

TRTRANTY

The **TRTRANTY** system initialization parameter specifies which trace entries should be copied from the internal trace table to the transaction dump trace table.

TRTRANTY={TRAN|ALL}
Valid values are as follows:

TRAN Only the trace entries associated with the transaction that is abending will be copied to the transaction dump trace table.

ALL All of the trace entries from the internal trace table will be copied to the transaction dump trace table. If the internal trace table size is larger than the transaction dump trace table size, the transaction dump trace table could wrap. This results in only the most recent trace entries being written to the transaction dump trace table.

TS

The **TS** system initialization parameter specifies whether you want to cold start temporary storage, as well as the number of VSAM buffers and strings to be used for auxiliary temporary storage.

TS=([COLD][,{0|3|decimal-value-1 }][,{3|decimal-value-2}])
Valid values are as follows:

COLD
The type of start for the temporary storage facility. COLD forces a cold start regardless of the value of the START parameter. If COLD is omitted, the TS start type is determined by the value of START.

0 No buffers are required; that is, only MAIN temporary storage is required.

decimal-value-1
The number of buffers to be allocated for the use of auxiliary temporary storage. The value must be in the range 3 through 32 767.

decimal-value-2
The number of VSAM strings to be allocated for the use of auxiliary temporary storage. The value must be in the range 1 through 255, and must not exceed the value specified in decimal-value-1. The default value is 3.

For example, TS=(,8,5) specifies 8 buffers and 5 strings.

The operands of the TS parameter are positional. You must code commas to indicate missing operands if others follow. For example, TS=(,8) specifies the number of buffers and allows the other operands to default.

TSMAINLIMIT

The **TSMAINLIMIT** system initialization parameter specifies a limit for the storage that is available for main temporary storage queues to use. You can specify an amount of storage in the range 1 - 32768 MB (32 GB), but this amount must not be greater than 25% of the value of the z/OS parameter **MEMLIMIT**. The default is 64 MB.

TSMAINLIMIT={64M|*nnnnn*M|*nn*G}

64M The default setting in megabytes.

***nnnnn*M**
An amount of storage in megabytes. The allowed range is 1 - 32768 MB.

***nn*G** An amount of storage in gigabytes. The allowed range is 1 - 32 GB.

For example, `TSMAINLIMIT=2G` makes 2 GB of storage available to main temporary storage queues.

When you set this parameter, check your current setting for the z/OS parameter **MEMLIMIT**. **MEMLIMIT** limits the amount of 64-bit storage that the CICS address space can use. Your setting for **TSMAINLIMIT** must not be greater than 25% of the **MEMLIMIT** value.

If you set the **TSMAINLIMIT** system initialization parameter to greater than 25% of the **MEMLIMIT** value, message DFHTS1608 is issued and CICS terminates. For information about the **MEMLIMIT** value for CICS, and instructions to check the value of **MEMLIMIT** that currently applies to the CICS region, see Estimating, checking, and setting MEMLIMIT in the Performance Guide. For further information about **MEMLIMIT** in z/OS, see Limiting the use of memory objects"Limiting the use of memory objects" in the *z/OS MVS Programming: Extended Addressability Guide*.

TST

The **TST** system initialization parameter specifies the temporary storage table suffix.

TST={NO|YES|*xx*}

NO CICS uses only RDO support for temporary storage queues, and does not load a TST.

YES CICS uses an unsuffixed version of the table, named DFHTST.

xx CICS uses a table named DFHTST*xx*. See "Defining CICS resource table and module keywords" on page 117 for information on defining the temporary storage table suffix.

Note: To use a TST in combination with TSMODEL resource definitions, you must assemble the TST load module with the MIGRATE option. If the TST is not assembled with the MIGRATE option, CICS loads the TST only and does not provide any RDO support for temporary storage queues, and any attempts to install TSMODEL resource definitions are rejected.

For information about coding the macros for this table, see the *CICS Resource Definition Guide* .

UDSASZE

The **UDSASZE** system initialization parameter specifies the size of the UDSA.

UDSASZE={0K|number}

The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256KB). If the size specified is not a multiple of 256KB (or 1MB if transaction isolation is active), CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the UDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 24-bit storage (below the line) is specified by the DSALIM system initialization parameter. You must allow at least 256K for each DSA in 24-bit storage for which you have not set a size.

UOWNETQL

The **UOWNETQL** system initialization parameter specifies a qualifier for the NETUOWID for units of work initiated on the local CICS region.

UOWNETQL=user_defined_value

UOWNETQL is required only if the z/OS Communications Server VTAM=NO is coded. The specified value is used in the following circumstances:

- CICS is being cold started and VTAM=NO has been specified.
- CICS is being cold started and the z/OS Communications Server ACB has failed to open.
- CICS is being started with VTAM=NO and the z/OS Communications Server ACB has not been opened since CICS was last cold started.
- CICS is being started, the z/OS Communications Server ACB has failed to open, and the z/OS Communications Server ACB has not been opened since CICS was last cold started.

If any of the above conditions apply and UOWNETQL is not specified, a dummy default UOWNETQL of 9UNKNOWN is used. This dummy UOWNETQL is invalid because the first character is a number. UOWNETQL is given this invalid name to avoid a conflict with any real, valid netid.

If any of the above conditions apply, UOWNETQL, or its default value, is used as the IPIC NETWORKID of this CICS region. It is also used as the default NETWORKID on IPCONN definitions for IPIC connections to other CICS regions.

The value you code can be from 1 to 8 characters long, and must consist of uppercase letters (A through Z), or numbers in the range 0 through 9. The first character must be a letter.

USERTR

The **USERTR** system initialization parameter specifies whether the master user trace flag is to be set on or off.

USERTR={ON|OFF}

If the user trace flag is off, the user trace facility is disabled, and EXEC CICS ENTER TRACENUM commands receive an INVREQ condition if EXCEPTION is not specified. If the program does not handle this condition the transaction will abend AEIP.

For programming information about the user trace facility using EXEC CICS ENTER TRACENUM commands, see the *CICS Application Programming Reference* manual.

USRDELAY

The **USRDELAY** system initialization parameter specifies the maximum time, in the range 0 - 10080 minutes (up to seven days), that an eligible user ID and its associated attributes are to be retained in the user table if the user ID is unused.

USRDELAY={30|number}

An entry in the user table for a user ID that is retained during the delay period can be reused.

A user ID that is eligible for reuse in the **USRDELAY** period must have one of the following properties:

- Received from remote systems
- Specified on the SECURITYNAME attribute in the CONNECTION resource
- Specified on the USERID attribute in the SESSIONS resource
- Specified on the USERID attribute in the definition of an intrapartition transient data queue
- Specified on the USERID option on a START command
- Specified on the USERID attribute for a non-terminal task, such as the alias tasks that are attached for processing HTTP requests

Within the **USRDELAY** period, a user ID in any one of these categories can be reused in one of the other categories, provided that the request for reuse has the same qualifiers. If a user ID is qualified by a different group ID, APPLID, or terminal ID, a retained entry is not reused, except when changing the terminal ID on LU6.2 when the retained entry is used.

If a user ID is unused for more than the **USRDELAY** limit, it is removed from the system, and the message DFHUS0200 is issued. You can suppress this message in an XMEOUT global user exit program. If you specify **USRDELAY=0**, all eligible user IDs are deleted immediately after use, and the message DFHUS0200 is not issued. Do not code **USRDELAY=0** if:

- This CICS region communicates with other CICS regions,

  and:
- ATTACHSEC=IDENTIFY is specified on the CONNECTION resource for the connections used,

  and

- The connections used carry high volumes of transaction routing or function shipping activity.

You should specify a value that gives the optimum level of performance for your CICS environment.

If you specify **USRDELAY=0** in the above scenario, CICS drives a full signon for each incoming request (with I/O to RACF) and a full signoff at the end of each transaction. For function shipping, there might be multiple signons and signoffs driven on a data-owning region for one task on an AOR.

If a value, other than 0, is specified for **USRDELAY**, the ability to change the attributes of the user or revoke the user ID becomes more difficult because the user ID and its attributes are retained in the region until the USRDELAY value has expired. For example, if you have specified **USRDELAY=30** for a user ID, but that user ID continues to run transactions every 25 minutes, the **USRDELAY** value never expires and any changes made to the user ID never comes into effect.

When running a remote transaction, a user ID remains signed-on to the remote CICS region (after the conversation associated with the first attach request is complete) until the delay specified by **USRDELAY** has elapsed since the last transaction associated with the attach request for the user ID has completed. When this event occurs, the user ID is removed from the remote CICS region.

If you specify a low value for the **USRDELAY** system initialization parameter to ensure that CICS quickly detects changes to RACF profiles, you might want to increase this value if your z/OS system is z/OS 1.11 or above, because from z/OS 1.11, CICS is notified immediately if RACF profile changes occur. The primary impact of a high **USRDELAY** value is that the amount of storage used for RACF control blocks is increased.

Related information:

Interpreting user domain statistics

USSHOME

The **USSHOME** system initialization parameter specifies the name and path of the root directory for CICS Transaction Server files on z/OS UNIX.

USSHOME={/usr/lpp/cicsts/cicsts42 | *directory* | NONE}

The value for the **USSHOME** system initialization parameter must match the directory that you specified for CICS Transaction Server files on z/OS UNIX when you installed CICS using the DFHISTAR installation job. The default value for the **USSHOME** system initialization parameter is /usr/lpp/cicsts/cicsts42, which matches the default values for the DFHISTAR installation job.
| The maximum length of the **USSHOME** system initialization parameter is 255
| characters.

If you changed any of the **TINDEX**, **PATHPREFIX**, or **USSDIR** parameters in the DFHISTAR installation job, you must specify a value for the **USSHOME** system initialization parameter to match the name and path that you specified for the root directory using those DFHISTAR parameters.

If you specify **USSHOME=NONE** instead of specifying a directory name, CICS does not use any default root directory in the UNIX System Services file system. In this case, some CICS functions that request data from this directory might produce unpredictable results.

VTAM (z/OS Communications Server)

The **VTAM** system initialization parameter specifies whether the z/OS Communications Server access method is to be used.

VTAM={YES|NO}
The default is VTAM=YES.

VTPREFIX

The **VTPREFIX** system initialization parameter specifies the first character to be used for the terminal identifiers (termids) of autoinstalled virtual terminals.

VTPREFIX={\|*character*}
Virtual terminals are used by the External Presentation Interface (EPI) and terminal emulator functions of the CICS Client products.

Termids generated by CICS for autoinstalled Client terminals consist of a 1-character prefix and a 3-character suffix. The default prefix is '\'. The suffix can have the values 'AAA' through '999'. That is, each character in the suffix can have the value 'A' through 'Z' or '0' through '9'. The first suffix generated by CICS has the value 'AAA'. This is followed by 'AAB', 'AAC', ... 'AAZ', 'AA0', 'AA1', and so on, up to '999'.

Each time a Client virtual terminal is autoinstalled, CICS generates a 3-character suffix that it has not recorded as being in use.

By specifying a prefix, you can ensure that the termids of Client terminals autoinstalled on this system are unique in your transaction routing network. This prevents the conflicts that could occur if two or more terminal-owning regions (TORs) ship definitions of Client virtual terminals to the same application-owning region (AOR).

If such a naming conflict does occur—that is, if a Client virtual terminal is shipped to an AOR on which a remote terminal of the same name is already installed—the autoinstall user program is invoked in the AOR. Your user program can resolve the conflict by allocating an alias terminal identifier to the shipped definition. For details of writing an autoinstall user program to install shipped definitions, see the *CICS Customization Guide*. However, you can avoid potential naming conflicts by specifying a different prefix, reserved for virtual terminals, on each TOR on which Client virtual terminals are to be installed.

You must not use the characters + - * < > = { } or blank.

Note:

1. When specifying a prefix, ensure that termids generated by CICS for Client terminals do not conflict with those generated by your autoinstall user program for user terminals, or with the names of any other terminals or connections.
2. Client terminal definitions are not recovered after a restart. Immediately after a restart, no Client terminals are in use, so when CICS generates suffixes it begins again with 'AAA'. This means that CICS does **not** always generate the same termid for any given Client terminal. This in turn means that server applications should not assume that a particular CICS-generated termid always equates to a particular Client terminal.

   If your server programs do make this assumption, you can use your autoinstall user program to allocate alias termids, by which the virtual terminals will be known to CICS, in a consistent manner.
3. Clients can override CICS Transaction Server for z/OS-generated termids.

WEBDELAY

The **WEBDELAY** system initialization parameter specifies two Web delay periods.

WEBDELAY=(5|time_out,60|keep_time)

These periods are:

1. A time-out period. The maximum time, in minutes, in the range 1-60, that a transaction started through the Web 3270 bridge interface, is allowed to remain in terminal wait state before it is automatically purged by CICS.
2. The terminal keep time. The time, in minutes, in the range 1-6000, during which state data is kept for a CICS Web 3270 bridge transaction, before CICS performs clean-up.

WRKAREA

The **WKRAREA** system initialization parameter specifies the number of bytes to be allocated to the common work area (CWA).

WRKAREA={512|number}

This area, for use by your installation, is initially set to binary zeros, and is available to all programs. It is not used by CICS. The maximum size for the work area is 3584 bytes.

XAPPC

The **XAPPC** system initialization parameter specifies whether RACF session security can be used when establishing APPC sessions.

XAPPC={NO|YES}

Valid values are as follows:

NO RACF session security cannot be used.

YES RACF session security can be used.

If you specify BINDSECURITY=YES for a particular APPC connection, a request to RACF is issued to extract the security profile. If the profile exists, it is used to bind the session.

Note: If you specify XAPPC=YES, the external security manager that you use must support the APPCLU general resource class, otherwise CICS fails to initialize.

Restrictions You can specify the XAPPC parameter in the SIT, PARM, or SYSIN only.

XCFGROUP

The **XCFGROUP** system initialization parameter specifies the name of the cross-system coupling facility (XCF) group to be joined by this region.

XCFGROUP={DFHIR000|*name*}

The group name must be eight characters long, padded on the right with blanks if necessary. The valid characters are A-Z 0-9 and the national characters $ # and @. To avoid using the names IBM uses for its XCF groups, do not begin group names with the letters A through C, E through I, or the character string “SYS”. Also, do not use the name “UNDESIG”, which is reserved for use by the system programmer in your installation.

It is recommended that you use a group name beginning with the letters “DFHIR”.

You can specify **XCFGROUP** on the SIT macro or as a SYSIN override. You cannot specify it as a console override.

Each CICS region can join only one XCF group, which happens when it signs on to CICS interregion communication (IRC). The default XCF group is DFHIR000.

XCF groups allow CICS regions in different MVS images within the same sysplex to communicate with each other across multi-region operation (MRO) connections.

Note: Regions in the same MVS image too, can communicate with each other using MRO, but this does not require a coupling facility. The only situation in which CICS regions in the same MVS image cannot communicate via MRO is when they are members of different XCF groups.

For introductory information about XCF/MRO, and instructions on how to set up XCF groups, see the *CICS Intercommunication Guide*.

XCMD

The **XCMD** system initialization parameter specifies whether you want CICS to perform command security checking, and optionally the RACF resource class name in which you have defined the command security profiles.

XCMD={YES|name|NO}

If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to use a CICS command for the specified resource. Such checking is performed every time a transaction tries to use a COLLECT, DISABLE, DISCARD, ENABLE, EXTRACT, INQUIRE, PERFORM, RESYNC, or SET command, or any of the FEPI commands, for a resource.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the CMDSEC(YES) option on the transaction resource definition.

YES CICS calls RACF, using the default class name of CICSCMD prefixed by C or V, to check whether the userid associated with a transaction is authorized to use a CICS command for the specified resource. The resource class name is CCICSCMD and the grouping class name is VCICSCMD.

name CICS calls RACF, using the specified resource class name prefixed by C or V, to verify that the userid associated with a transaction is authorized to use a CICS command for the specified resource. The resource class name is C*name* and the grouping class name is V*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any command security checks, allowing any user to use commands that would be subject to those checks.

Restrictions: You can specify the **XCMD** parameter in the SIT, PARM, or SYSIN only.

XDB2

The **XDB2** system initialization parameter specifies whether you want CICS to perform DB2ENTRY security checking.

XDB2={NO|name}
Valid values are as follows:

NO CICS does not perform any DB2 resource security checks.

name CICS calls RACF, using the specified general resource class name, to check whether the userid associated with the CICS DB2 transaction is authorized to access the DB2ENTRY referenced by the transaction.

Unlike the other X*aaa* system initialization parameters, this DB2 security parameter does not provide a YES option that implies a default CICS resource class name for DB2ENTRY resources. You have to specify your own DB2 resource class name.

XDCT

The **XDCT** system initialization parameter specifies whether you want CICS to perform resource security checking for transient data queues.

XDCT={YES|name|NO}
If you specify YES or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access the transient data queue. Such checking is performed every time a transaction tries to access a transient data queue.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the RESSEC(YES) option on the transaction resource definition.

YES CICS calls RACF, with the default CICS resource class name of CICSDCT prefixed by D or E, to verify whether the userid associated with the transaction is authorized to access the specified transient data queue.

The resource class name is DCICSDCT and the grouping class name is ECICSDCT.

name CICS calls RACF, using the specified resource class name, to check whether the userid associated with the transaction is authorized to access the specified transient data queue. The resource class name is D*name* and the grouping class name is E*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any transient data security checks, allowing any user to access any transient data queue.

Restrictions: You can specify the XDCT parameter in the SIT, PARM, or SYSIN only.

XEJB

The **XEJB** system initialization parameter specifies whether support of security roles is enabled.

XEJB={YES|NO}
Valid values are as follows:

YES CICS support for security roles is enabled:

- When an application invokes a method of an enterprise bean, CICS calls the external security manager to verify that the userid associated with the transaction is defined in at least one of the security roles associated with the method.

- When an application invokes the `isCallerInRole()` method, CICS calls the external security manager to determine whether the userid associated with the transaction is defined in the role specified on the method call.

NO CICS support for security roles is disabled:

- CICS does not perform enterprise bean method level checks, allowing any userid to invoke any enterprise bean method.
- The `isCallerInRole()` method always returns a value of `true`.

Restrictions:

1. You can specify the XEJB parameter in the SIT, PARM, or SYSIN only.
2. To enable security role support, you must also specify SEC=YES.

XFCT

The **XFCT** system initialization parameter specifies whether you want CICS to perform file resource security checking, and optionally specifies the RACF resource class name in which you have defined the file resource security profiles.

XFCT={YES|name|NO}

If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access File Control-managed files. Such checking is performed every time a transaction tries to access a file managed by CICS file control. The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

Note: You can specify the **XFCT** parameter in the SIT, PARM, or SYSIN only.

YES CICS calls RACF, using the default CICS resource class name of CICSFCT prefixed by F or H, to verify that the userid associated with a transaction is authorized to access files reference by the transaction. The resource class name is FCICSFCT and the grouping class name is HCICSFCT.

name CICS calls RACF, using the specified resource class name, to verify that the userid associated with a transaction is authorized to access files referenced by the transaction. The resource class name is F*name* and the grouping class name is H*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any file resource security checks, allowing any user to access any file.

XHFS

The **XHFS** system initialization parameter specifies whether CICS is to check the transaction user's ability to access files in the z/OS UNIX System Services file system.

XHFS={YES|NO}

At present, this checking applies only to the user ID of the Web client when CICS Web support is returning z/OS UNIX file data as the static content identified by a URIMAP definition. The checking is performed only if you have specified YES for the SEC system initialization parameter. However, the RESSEC option on the transaction resource definition does not affect this security checking.

Note: You can specify the **XHFS** parameter in the SIT, PARM, or SYSIN only.

YES
CICS is to check whether the user identified as the Web client is authorized to access the file identified by the URIMAP that matches the incoming URL. This check is in addition to the check performed by z/OS UNIX System Services against the CICS region user ID. If access to the file is denied for either of these user IDs, the HTTP request is rejected with a 403 (Forbidden) response.

NO
CICS is not to check the client user's access to z/OS UNIX files. Note that the CICS region user ID's access to these files is still checked by z/OS UNIX System Services.

XJCT

The **XJCT** system initialization parameter specifies whether you want CICS to perform journal resource security checking.

XJCT={YES|name|NO}
If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access the referenced journal. Such checking is performed every time a transaction tries to access a CICS journal. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC is active for the resource definitions.

Note: You can specify the **XJCT** parameter in the SIT, PARM, or SYSIN only.

YES
CICS calls RACF using the default CICS resource class name of CICSJCT prefixed by a J or K, to check whether the userid associated with a transaction is authorized to access CICS journals referenced by the transaction. The resource class name is JCICSJCT and the grouping class name is KCICSJCT.

name
CICS calls RACF, using the specified resource class name prefixed by J or K, to verify that the userid associated with a transaction is authorized to access CICS journals.

The resource class name specified must be 1 through 7 characters.

NO
CICS does not perform any journal resource security checks, allowing any user to access any CICS journal.

XLT

The **XLT** system initialization parameter specifies a suffix for the transaction list table.

XLT={NO|xx|YES}
The table contains a list of transactions that can be attached during the first quiesce stage of system termination. See “Defining CICS resource table and module keywords” on page 117.

YES
The default transaction list table, DFHXLT, is used.

xx
The transaction list table DFHXLTxx is used.

NO
A transaction list table is not used.

For guidance information about coding the macros for this table, see the *CICS Resource Definition Guide*

XPCT

The **XPCT** system initialization parameter specifies whether you want CICS to perform started transaction resource security checking, and optionally specifies the name of the RACF resource class name in which you have defined the started task security profiles.

XPCT={YES|name|NO}

If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to use started transactions and related EXEC CICS commands. Such checking is performed every time a transaction tries to use a started transaction or one of the EXEC CICS commands: COLLECT STATISTICS TRANSACTION, DISCARD TRANSACTION, INQUIRE TRANSACTION, or SET TRANSACTION. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

Note: You can specify the **XPCT** parameter in the SIT, PARM, or SYSIN only.

YES CICS calls RACF using the default CICS resource class name CICSPCT prefixed with A or B, to verify that the userid associated with a transaction is authorized to use started transactions or related EXEC CICS commands.

The resource class name is ACICSPCT and the grouping class name is BCICSPCT.

name CICS calls RACF, using the specified resource class name, to verify that the userid associated with a transaction is authorized to use started transactions or related EXEC CICS commands. The resource class name is ACICSPCT and the grouping class name is BCICSPCT.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any started task resource security checks, allowing any user to use started transactions or related EXEC CICS commands.

XPPT

The **XPPT** system initialization parameter specifies that CICS is to perform application program resource security checks and optionally specifies the RACF resource class name in which you have defined the program resource security profiles.

XPPT={YES|name|NO}

You can specify the **XPPT** parameter in the SIT, PARM, or SYSIN only. Checking is performed every time a transaction tries to invoke another program by using one of the CICS commands: LINK, LOAD, or XCTL.

Note: The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

YES CICS calls RACF, using the default resource class name prefixed by M or N, to verify that the userid associated with a transaction is authorized to use LINK, LOAD, or XCTL commands to invoke other programs. The resource class name is MCICSPPT and the grouping class name is NCICSPPT.

name CICS calls RACF, with the specified resource class name prefixed by M or N, to verify that the userid associated with a transaction is authorized to use LINK, LOAD, or XCTL commands to invoke other programs. The resource class name is M*name* and the grouping class name is N*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any application program authority checks, allowing any user to use LINK, LOAD, or XCTL commands to invoke other programs.

XPSB

The **XPSB** system initialization parameter specifies whether you want CICS to perform program specification block (PSB) security checking and optionally specifies the RACF resource class name in which you have defined the PSB security profiles.

XPSB={YES|name|NO}

You can specify the **XPSB** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to check that the userid associated with a transaction is authorized to access PSBs (which describe databases and logical message destinations used by application programs). Such checking is performed every time a transaction tries to access a PSB.

Note:

1. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.
2. If you require security checking for PSBs to apply to remote users who access this region by means of transaction routing, the system initialization parameter **PSBCHK**=YES must be specified. For more information about this parameter, see "PSBCHK" on page 197.

YES CICS calls RACF, using the default resource class name CICSPSB prefixed by P or Q, to verify that the userid associated with a transaction is authorized to access PSBs. The resource class name is PCICSPSB and the grouping class name is QCICSPSB.

name CICS calls RACF, using the specified resource class name prefixed by P or Q, to verify that the userid associated with a transaction is authorized to access PSBs. The resource class name is P*name* and the grouping class name is Q*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any PSB resource security checks, allowing any user to access any PSB.

XRES

The **XRES** system initialization parameter specifies whether you want CICS to perform resource security checking for particular CICS resources and optionally specifies the general resource class name in which you have defined the resource security profiles.

XRES={YES|*name*|NO}

You can specify the **XRES** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a general resource class name, CICS calls the external security manager to verify that the user ID associated with a transaction is authorized to use the resource. This checking is performed every time a transaction tries to access a resource.

The actual profile name passed to the external security manager is the name of the resource to be checked, prefixed by its resource type; for example, for a document template whose resource definition is named “WELCOME", the profile name passed to the external security manager is DOCTEMPLATE.WELCOME. Even if a command references the document template using its 48-character template name, the shorter name (up to 8 characters) of the DOCTEMPLATE resource definition is always used for security checking.

The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the TRANSACTION resource definition.

YES
CICS calls the external security manager, using the default CICS resource class name of RCICSRES, to check whether the user ID associated with a transaction is authorized to use the resource it is trying to access. The resource class name is RCICSRES and the grouping class name is WCICSRES.

name
CICS calls the external security manager, using the specified resource class name prefixed by the letter R, to check whether the user ID associated with a transaction is authorized to use the resource it is trying to access. The resource class name is R*name* and the grouping class name is W*name*. The resource class name specified must be 1 through 7 characters.

NO
CICS does not perform any security checks for resources, allowing access to any user.

For a list of commands subject to XRES resource class checks, together with their respective profiles, see Resource and command check cross reference.

XRF

The **XRF** system initialization parameter specifies whether XRF support is to be included in the CICS region.

XRF={NO|YES} (active and alternate)
If the CICS region is started with the START=STANDBY system initialization parameter specified, the CICS region is the alternate CICS region. If the CICS region is started with the START=AUTO, START=INITIAL or START=COLD system initialization parameter specified, the CICS region is the active CICS region. The active CICS region signs on as such to the CICS availability manager.

If you specify XRF=YES, do not specify a value for the **GRNAME** system initialization parameter. Any value specified is set to blanks.

XRFSOFF

The **XRFSOFF** system initialization parameter is obsolete and is only kept for compatibility.

XRFSOFF={NOFORCE|FORCE}
If it is specified, it is rejected with a message and RSTSIGNOFF is assumed.

XRFSTME

The **XRFSTME** system initialization parameter is obsolete and is only kept for compatibility.

XRFSTME={5|decimal-value}
If it is specified, it is rejected with a message and RSTSIGNTIME is assumed.

XTRAN

The **XTRAN** system initialization parameter specifies whether you want CICS to perform transaction-attach security checking and optionally specifies the RACF resource class name in which you have defined the transaction security profiles.

XTRAN={YES|*name*|NO}
You can specify the **XTRAN** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with the transaction is permitted to run the transaction.

Note: The checking is performed only if you have specified YES for the **SEC** system initialization parameter.

YES CICS calls RACF, using the default CICS resource class name of CICSTRN prefixed by T or G, to verify that the userid associated with the transaction is authorized to run the transaction. The resource class name is TCICSTRN and the grouping class name is GCICSTRN.

name CICS calls RACF, using the specified resource class name prefixed by T or G, to verify that the userid associated with the transaction is authorized to run the transaction. The resource class name is T*name* and the corresponding grouping class name is G*name*.

The name specified must be 1 through 7 characters.

NO CICS does not perform any transaction-attach security checks, allowing any user to run any transaction.

XTST

The **XTST** system initialization parameter specifies whether you want CICS to perform security checking for temporary storage queues and optionally specifies the RACF resource class name in which you have defined the temporary storage security profiles.

XTST={YES|name|NO}
You can specify the XTST parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a temporary storage request is authorized to access the referenced temporary storage queue.

Security checking for temporary storage queues is performed only if you have specified all of the following options in addition to the XTST parameter:
- YES for the **SEC** system initialization parameter
- RESSEC(YES) in the relevant TRANSACTION resource definitions
- SECURITY(YES) in your TSMODEL resource definitions
- If you use a temporary storage table (TST), the DFHTST TYPE=SECURITY macro

YES CICS calls RACF, using the default CICS resource class name of CICSTST prefixed by S or U, to verify that the userid associated with the transaction is authorized to access temporary storage queues referenced by the transaction. The resource class name is SCICSTST and the corresponding grouping class name is UCICSTST.

name CICS calls RACF, using the specified resource class name prefixed by S or U, to verify that the userid associated with a transaction is authorized to access temporary storage queues.

The name specified must be 1 through 7 characters.

NO CICS does not perform any temporary storage security checks, allowing any user to access any temporary storage queue.

XUSER

The **XUSER** system initialization parameter specifies whether CICS is to perform surrogate user checks.

XUSER={YES|NO}

You can specify the **XUSER** parameter in the SIT, PARM, or SYSIN only. Valid values are as follows:

YES CICS is to perform surrogate user checking in all those situations that permit such checks to be made; for example, on EXEC CICS START commands without an associated terminal. Surrogate user security checking is also performed by CICS against user IDs installing or modifying DB2 resource definitions that specify AUTHID or COMAUTHID.

Note: The **XUSER** parameter is also used by CICS to control access to the AUTHTYPE and COMAUTHTYPE attributes on DB2 resource definitions, although not through surrogate user checks. For more information about AUTHTYPE and COMAUTHTYPE attributes, see the *CICS Resource Definition Guide*.

For information about the various circumstances in which CICS performs surrogate user checks, see the *CICS RACF Security Guide*.

NO CICS is not to perform any surrogate user checking.

System initialization parameters that can be defined only with the DFHSIT macro

Some system initialization parameters can be defined in just one way, in a DFHSIT macro.

ESMEXITS

The **ESMEXITS** system initialization parameter specifies whether installation data is to be passed through the RACROUTE interface to the external security manager (ESM) for use in exits written for the ESM.

ESMEXITS={NOINSTLN|INSTLN}

Valid values are as follows:

NOINSTLN
The INSTLN parameter is not used in RACROUTE macros.

INSTLN
CICS-related and installation-supplied data is passed to the ESM using the INSTLN parameter of the RACROUTE macro. For programming

information, including the format of the data passed, see the *CICS Customization Guide*. This data is intended for use in exits written for the ESM.

Restrictions You can specify the ESMEXITS parameter in the SIT only.

HPO

The **HPO** system initialization parameter specifies whether you want to use the z/OS Communications Server authorized path feature of the high performance option (HPO).

HPO={NO|YES}

If you code YES, the CICS type 6 SVC must be link-edited in your MVS nucleus, and defined to MVS in an SVCPARM statement. If the SVC number is not 215 (the default) you must specify the SVC number on the **SRBSVC** parameter.

For information about installing the CICS type 6 SVC in your MVS system, and about changing the default number, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the HPO parameter in the SIT only.

STARTER

The **STARTER** system initialization parameter specifies whether the generation of starter system modules (with $ and # suffixes) is permitted, and various MNOTES are to be suppressed.

STARTER={NO|YES}

This parameter should only be used when service is being performed on starter system modules.

Restrictions You can specify the **STARTER** parameter in the SIT only.

SUFFIX

The **SUFFIX** system initialization parameter specifies the last two characters of the name of this system initialization table.

SUFFIX=xx

The first 6 characters of the name of the SIT are fixed as DFHSIT. You can specify the last two characters of the name, using the SUFFIX parameter. Because the SIT does not have a TYPE=INITIAL macro statement like other CICS resource control tables, you specify its SUFFIX on the TYPE=CSECT macro statement.

The suffix allows you to have more than one version of the SIT. Any one or two characters (other than NO and DY) are valid. You select the version of the table to be loaded into the system during system initialization by coding SIT=xx, either in the PARM parameter or the SYSIN data set. (You can, in some circumstances, specify the SIT using the system console, but this is not recommended.)

Restrictions You can specify the **SUFFIX** parameter in the SIT only.

System initialization parameters that cannot be defined with the DFHSIT macro

Some system initialization parameters cannot be defined in a DFHSIT macro.

Specify these parameters in one of the following ways:

- In the PARM parameter of the EXEC PGM=DFHSIP statement
- In the SYSIN data set defined in the startup job stream
- Through the system operator's console

CDSASZE

The **CDSASZE** system initialization parameter specifies the size of the CDSA.

CDSASZE={0K|number}

The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256KB). If the size specified is not a multiple of 256KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the **CDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 24-bit**
| **storage (below the line) is specified by the DSALIM system initialization**
| **parameter. You must allow at least 256K for each DSA in 24-bit storage for**
| **which you have not set a size.**

CHKSTRM

The **CHKSTRM** parameter specifies that terminal storage-violation checking is to be activated or deactivated.

CHKSTRM={CURRENT|NONE}

Valid values are as follows:

CURRENT

TIOA storage violations are to be checked.

NONE

TIOA storage-violation checking is to be deactivated.

You can also use the CICS-supplied transaction, CSFE, to switch terminal storage-violation checking on and off.

For information about checking for storage violations, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **CHKSTRM** parameter in PARM, SYSIN, or CONSOLE only.

CHKSTSK

The **CHKSTSK** parameter specifies that task storage-violation checking at startup is to be activated or deactivated.

CHKSTSK={CURRENT|NONE}
Valid values are as follows:

CURRENT
All storage areas on the transaction storage chain for the current task only are to be checked.

NONE
Task storage-violation checking is to be deactivated.

You can also use the CICS-supplied transaction, CSFE, to switch task storage-violation checking on and off.

For information about checking for storage violations, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **CHKSTSK** parameter in PARM, SYSIN, or CONSOLE only.

ECDSASZE

The **ECDSASZE** system initialization parameter specifies the size of the ECDSA.

ECDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 - 1073741824 bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of KBs (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **ECDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 31-bit**
| **storage (above the line) is specified by the EDSALIM system initialization**
| **parameter. You must allow at least 1 MB for each DSA in 31-bit storage for**
| **which you have not set a size.**

ERDSASZE

The **ERDSASZE** system initialization parameter specifies the size of the ERDSA.

ERDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 to 1073741824

bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **ERDSAZSE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.**

ESDSASZE

The **ESDSASZE** system initialization parameter specifies the size of the ESDSA.

ESDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 to 1073741824 bytes in multiples of 1048576 bytes (1 MB). If the size specified is not a multiple of 1 MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restriction: You can specify the **ESDSASZE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.**

EUDSASZE

The **EUDSASZE** system initialization parameter specifies the size of the EUDSA.

EUDSASZE={0K|number}
The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
Specify number as an amount of storage in the range 0 to 1073741824 bytes in multiples of 1048576 bytes (1MB). If the size specified is not a multiple of 1MB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the EUDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 31-bit storage (above the line) is specified by the EDSALIM system initialization parameter. You must allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size.

JVMLEVEL0TRACE

The **JVMLEVEL0TRACE** system initialization parameter specifies the default option for pooled JVM Level 0 trace, corresponding to trace level 29 of the SJ component.

JVMLEVEL0TRACE={'ALL(EXCEPTION)'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 0 for pooled JVMs, which is reserved for extraordinary events and errors. Unlike CICS exception trace, which cannot be switched off, the JVM Level 0 trace is usually switched off unless JVM tracing is required. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

This parameter does not apply to JVM server tracing.

JVMLEVEL1TRACE

The **JVMLEVEL1TRACE** system initialization parameter specifies the default option for pooled JVM Level 1 trace, corresponding to trace level 30 of the SJ component.

JVMLEVEL1TRACE={'ALL(ENTRY,EXIT)'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 1 for pooled JVMs. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

This parameter does not apply to JVM server tracing.

JVMLEVEL2TRACE

The **JVMLEVEL2TRACE** system initialization parameter specifies the default option for pooled JVM Level 2 trace, corresponding to trace level 31 of the SJ component.

JVMLEVEL2TRACE={'ALL'|'*user override string*'}

The default setting for this level of tracing maps to trace point level 2 for pooled JVMs. The JVM trace point levels go up to level 9. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

This parameter does not apply to JVM server tracing.

JVMUSERTRACE

The **JVMUSERTRACE** system initialization parameter specifies the default option for JVM user trace, corresponding to trace level 32 of the SJ component.

JVMUSERTRACE={'NONE'|'*user override string*'}
Use this option for more complex specifications for JVM tracing. "JVMxxxxTRACE" on page 176 has more information about these system initialization parameters.

NEWSIT

The **NEWSIT** system initialization parameter specifies whether CICS is to load the specified SIT, and enforce the use of all system initialization parameters, modified by any system initialization parameters provided by PARM, SYSIN, or the system console, even in a warm start.

NEWSIT={YES|NO}
Enforcing the use of system initialization parameters in this way overrides any parameters that may have been stored in a warm keypoint at shutdown.

However, there are some exceptions. The following system initialization parameters are always ignored in a warm start, even if they are supplied by PARM, SYSIN, or the console:

- CSDACC
- CSDBUFND
- CSDBUFNI
- CSDDISP
- CSDDSN
- CSDFRLOG
- CSDINTEG
- CSDJID
- CSDLSRNO
- CSDRECOV
- CSDRLS
- CSDSTRNO
- FCT
- GRPLIST

In a warm restart, CICS uses the **installed** resource definitions saved in the CICS global catalog at warm shutdown, and therefore the CSD, FCT, and GRPLIST parameters are ignored. (At CICS startup, you can only modify installed resource definitions, including file control table entries, or change to a new FCT, by performing a cold start of CICS with START=COLD.)

For more information about the use of the NEWSIT parameter, see "Controlling start and restart" on page 294.

Restrictions

You can specify the NEWSIT parameter in PARM, SYSIN, or CONSOLE only.

OFFSITE

The **OFFSITE** system initialization parameter specifies whether CICS is to restart in off-site recovery mode; that is, a restart is taking place at a remote site.

OFFSITE={NO|YES}
For a successful off-site restart, the log records of the failed CICS region must be available at the remote site. CICS does not provide a facility for shipping log records to a remote backup site, but you can use a suitable vendor product

to perform this function. See the relevant product documentation for other procedures you need to follow for a remote site restart.

See the *CICS Recovery and Restart Guide* for more information about remote site recovery.

NO CICS will not perform the special restart processing required for remote site recovery.

YES CICS will perform an off-site restart at a remote site following a disaster at the primary site. CICS performs this special processing for an off-site restart, because some information (for example, a VSAM lock structure) is not available at the remote site.

CICS performs an emergency restart, even if the global catalog indicates that CICS can do a warm start. OFFSITE=YES is valid with START=AUTO only, and CICS initialization is terminated if you specify START=COLD or INITIAL.

Restrictions

You can specify the OFFSITE parameter in PARM, SYSIN, or CONSOLE only.

PRVMOD

The **PRVMOD** system initialization parameter specifies the names of those modules that are not to be used from the LPA.

PRVMOD={name|(name,name...name)}

The operand is a list of 1-8 character module names. This enables you to use a private version of a CICS nucleus module in the CICS address space, and not a version that might be in the LPA. For information about **PRVMOD**, see the *CICS Transaction Server for z/OS Installation Guide*.

Restrictions You can specify the **PRVMOD** parameter in PARM, SYSIN, or CONSOLE only.

RDSASZE

The **RDSASZE** system initialization parameter specifies the size of the RDSA.

RDSASZE={0K|number}

The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number

specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256 KB). If the size specified is not a multiple of 256 KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the RDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 24-bit storage (below the line) is specified by the DSALIM system initialization parameter. You must allow at least 256K for each DSA in 24-bit storage for which you have not set a size.

SDSASZE

The **SDSASZE** system initialization parameter specifies the size of the SDSA.

SDSASZE={0K|number}
The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256 KB). If the size specified is not a multiple of 256 KB, CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096 KB), or a whole number of megabytes (for example, 4 MB).

Restrictions You can specify the **SDSAZSE** parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
Setting the size of individual dynamic storage areas (DSAs) is not usually necessary and is not recommended. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize. The limit on the storage available for the DSAs in 24-bit storage (below the line) is specified by the DSALIM system initialization parameter. You must allow at least 256K for each DSA in 24-bit storage for which you have not set a size.

SIT

The **SIT** system initialization parameter specifies the suffix, if any, of the system initialization table that you want CICS to load at the start of initialization.

SIT=xx
If you omit this parameter, CICS loads the unsuffixed table, DFHSIT, which is pregenerated with all the default values. This default SIT (shown in "The default system initialization table" on page 278) is in CICSTS42.CICS.SDFHAUTH, and its source, named DFHSIT$$, is in CICSTS42.CICS.SDFHSAMP.

Restrictions You can specify the system initialization parameter anywhere in PARM or SYSIN, or as the **first** parameter entry at the CONSOLE.

SPCTRxx

The **SPCTRxx** system initialization parameter specifies the level of special tracing for a particular CICS component used by a transaction, terminal, or both.

SPCTRxx={(1,2)|(1[,2][,3][,4][,29][,30][,31][,32])|ALL|OFF}
You identify the component by coding a value for *xx* in the keyword. You code one SPCTRxx keyword for each component you want to define selectively. For

a CICS component being specially traced that does not have its trace level set by SPCTRxx, the trace level is that set by **SPCTR** (which, in turn, defaults to (1,2)). The CICS component codes that you can specify for *xx* on the SPCTRxx keyword are shown in the following table:

Code	**Component name**
AP	Application domain
BA	Business application manager
BF*	Built-in function
BM*	Basic mapping support
BR*	3270 bridge
CP*	Common programming interface
DC*	Dump compatibility layer
DD	Directory manager domain
DH	Document handling domain
DI*	Data interchange
DM	Domain manager domain
DP	Debugging profiles domain
DS	Dispatcher domain
DU	Dump domain
EC*	Event capture and emission
EI*	Exec interface
EJ	Enterprise Java domain
EM	Event manager domain
EP	Event processing domain
FC*	File control
GC	Global catalog domain
IC*	Interval control
IE	ECI over TCP/IP domain
II	IIOP domain
IS*	ISC or IRC
KC*	Task control
KE	Kernel
LC	Local catalog domain
LD	Loader domain
LG	Log manager domain
LM	Lock domain
ME	Message domain
ML	Markup language domain
MN	Monitoring domain
NQ	Enqueue domain
OT	Object transaction domain
PA	Parameter domain

Code	Component name
PC*	Program control
PG	Program manager domain
PI	Pipeline domain
PT	Partner domain
RA	Resource manager adapters
RI*	Resource manager interface (RMI)
RL	Resource life-cycle domain
RM	Recovery manager domain
RS	Region status domain
RX	RRS-coordinated EXCI domain
RZ	Request streams domain
SC*	Storage control
SH	Scheduler services domain
SJ	JVM domain
SM	Storage manager domain
SO	Sockets domain
ST	Statistics domain
SZ*	Front End Programming Interface
TC*	Terminal control
TD*	Transient data
TI	Timer domain
TR	Trace domain
TS	Temporary storage domain
UE*	User exit interface
US	User domain
WB	Web domain
WU	System management RESTful API
W2	Web 2.0 domain
XM	Transaction manager domain
XS	Security manager domain

Note:

1. Components marked * are subcomponents of the AP domain. The trace entries for these components are produced with a trace point ID of AP *nnnn*.
2. For the DS domain function CHANGE_MODE, a trace entry is generated if DS level 2 or 3 tracing is active.

number

The level numbers for the level of special tracing you want for the required CICS component. You can use level numbers 1, 2, 3, 4, 29, 30, 31 and 32, depending on the component.

Most CICS components only use levels 1, 2 and 3, and some do not have trace points at all these levels. The exceptions are:

- The SM component (storage manager domain) has level 4 tracing. This level of tracing is intended for IBM field engineering staff.
- The SJ component (JVM domain) has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You can use the system initialization parameters **JVMLEVEL0TRACE**, **JVMLEVEL1TRACE**, **JVMLEVEL2TRACE** and **JVMUSERTRACE** to specify options for these JVM trace levels, and then activate them using the **SPCTRSJ** system initialization parameter.

  When you activate JVM trace, using trace levels 29–32 for the SJ component, the JVM trace appears as CICS trace point SJ 4D02 (when formatted), or SJ 4D01 (if unformatted).

ALL You want all the available levels of special CICS tracing switched on for the specified component.

OFF Switches off all levels of special CICS tracing for the CICS component indicated by xx.

For details of using trace, see the *CICS Problem Determination Guide*.

Restrictions You can specify the **SPCTRxx** parameter in PARM, SYSIN, or CONSOLE only.

STNTRxx

The **STNTRxx** system initialization parameter specifies the level of standard tracing you require for a particular CICS component.

STNTRxx={1|(1[,2][,3][,4][,29][,30][,31][,32])|ALL|OFF}

You identify the component by coding a value for xx in the keyword. You code one STNTRxx keyword for each component you want to define selectively. For a CICS component being specially traced that does not have its trace level set by STNTRxx, the trace level is that set by STNTR (which, in turn, defaults to 1). You can select up to three levels of tracing, but some CICS components do not have trace points at all these levels.

The CICS component codes that you can specify for xx on this STNTRxx keyword are shown in the following table:

Code	Component name
AP	Application domain
BA	Business application manager
BF*	Built-in function
BM*	Basic mapping support
BR*	3270 bridge
CP*	Common programming interface
DC*	Dump compatibility layer
DD	Directory manager domain
DH	Document handling domain
DI*	Data interchange
DM	Domain manager domain
DP	Debugging profiles domain
DS	Dispatcher domain
DU	Dump domain

Code	Component name
EC*	Event capture and emission
EI*	Exec interface
EJ	Enterprise Java domain
EM	Event manager domain
EP	Event processing domain
FC*	File control
GC	Global catalog domain
IC*	Interval control
IE	ECI over TCP/IP domain
II	IIOP domain
IS*	ISC or IRC
KC*	Task control
KE	Kernel
LC	Local catalog domain
LD	Loader domain
LG	Log manager domain
LM	Lock domain
ME	Message domain
ML	Markup language domain
MN	Monitoring domain
NQ	Enqueue domain
OT	Object transaction domain
PA	Parameter domain
PC*	Program control
PG	Program manager domain
PI	Pipeline domain
PT	Partner domain
RA	Resource manager adapters
RI*	Resource manager interface (RMI)
RL	Resource life-cycle domain
RM	Recovery manager domain
RS	Region status domain
RX	RRS-coordinated EXCI domain
RZ	Request streams domain
SC*	Storage control
SH	Scheduler services domain
SJ	JVM domain
SM	Storage manager domain
SO	Sockets domain
ST	Statistics domain
SZ*	Front End Programming Interface

Code	Component name
TC*	Terminal control
TD*	Transient data
TI	Timer domain
TR	Trace domain
TS	Temporary storage domain
UE*	User exit interface
US	User domain
WB	Web domain
WU	System management RESTful API
W2	Web 2.0 domain
XM	Transaction manager domain
XS	Security manager domain
Note: 1. Components marked * are subcomponents of the AP domain. The trace entries for these components are produced with a trace point ID of AP *nnnn*. 2. For the DS domain function CHANGE_MODE, a trace entry is generated if DS level 2 or 3 tracing is active.	

ALL You want all the available levels of standard tracing switched on for the specified component.

Warning! Selecting ALL for standard tracing for the storage manager (SM) component, or the temporary storage domain (TS), degrades the performance of your CICS region. This is because ALL switches on trace flags that are used by SM domain for field engineering purposes.

Warning! Selecting ALL for standard tracing for the JVM domain (SJ) component is not recommended. JVM trace can produce a large amount of output, so you should normally activate JVM trace for special transactions (using the SPCTRSJ system initialization parameter), rather than turning it on globally for all transactions.

number

The level number(s) for the level of standard tracing you want for the CICS component indicated by `xx`. Level numbers 1, 2, 3, 4, 29, 30, 31 and 32 can be used, depending on the component.

Most CICS components only use levels 1, 2 and 3, and some do not have trace points at all these levels. The exceptions are:

- The SM component (storage manager domain), which also has level 4 tracing. This level of tracing is intended for IBM field engineering staff.

  Warning! Selecting tracing levels 3, 4, or ALL for standard tracing for the storage manager (SM) component, or the temporary storage domain (TS), degrades the performance of your CICS region. This is because options 3 and 4 (and ALL) switch on trace flags that are used by SM domain for field engineering purposes.

  SM trace flag 3 deactivates the quickcell mechanism, and SM trace flag 4 forces subpool element chaining on every CICS subpool. Furthermore, once these settings have been activated during system initialization, they cannot be unset, either through a PLTPI program or by using the CETR trace transaction, because they are not used for tracing as such. Thus, a significant performance overhead is incurred if these storage manager trace levels are selected for standard tracing.

See the *CICS Problem Determination Guide* for information about the effects of trace levels 3 and 4.

- The SJ component (JVM domain), which also has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You can use the system initialization parameters JVMLEVEL0TRACE, JVMLEVEL1TRACE, JVMLEVEL2TRACE and JVMUSERTRACE to specify options for these JVM trace levels, and then activate them using the SPCTRSJ system initialization parameter.

  Warning! Selecting tracing levels 29, 30, 31, 32 or ALL for standard tracing for the JVM domain (SJ) component is not recommended. JVM trace can produce a large amount of output, so you should normally activate JVM trace for special transactions (using the SPCTRSJ system initialization parameter), rather than turning it on globally for all transactions.

OFF Switches off all levels of standard CICS tracing for the CICS component indicated by xx.

Restrictions You can specify the STNTRxx parameter in PARM, SYSIN, or CONSOLE only.

UDSASZE

The **UDSASZE** system initialization parameter specifies the size of the UDSA.

UDSASZE={0K|number}
The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.

number
specify number as an amount of storage in the range 0 to 16777215 bytes in multiples of 262144 bytes (256KB). If the size specified is not a multiple of 256KB (or 1MB if transaction isolation is active), CICS rounds the value up to the next multiple.

You can specify number in bytes (for example, 4194304), or as a whole number of kilobytes (for example, 4096K), or a whole number of megabytes (for example, 4M).

Restrictions You can specify the UDSAZSE parameter in PARM, SYSIN, or CONSOLE only.

CAUTION:
| **Setting the size of individual dynamic storage areas (DSAs) is not usually**
| **necessary and is not recommended. If you specify DSA size values that in**
| **combination do not allow sufficient space for the remaining DSAs, CICS**
| **fails to initialize. The limit on the storage available for the DSAs in 24-bit**
| **storage (below the line) is specified by the DSALIM system initialization**
| **parameter. You must allow at least 256K for each DSA in 24-bit storage for**
| **which you have not set a size.**

System initialization parameters that cannot be defined through the system operator's console

Some system initialization parameters cannot be defined through the system operator's console.

Specify these parameters in one of the following ways:
- With the DFHSIT macro
- In the PARM parameter of the EXEC PGM=DFHSIP statement
- In the SYSIN data set defined in the startup job stream

CMDSEC

The **CMDSEC** parameter specifies whether or not you want CICS to honor the CMDSEC option specified on a transaction's resource definition.

CMDSEC={ASIS|ALWAYS}
Valid values are as follows:

ASIS means that CICS honors the CMDSEC option defined in a transaction's resource definition. CICS calls its command security checking routine only when CMDSEC(YES) is specified in a transaction resource definition.

ALWAYS
CICS overrides the CMDSEC option, and always calls its command security checking routine to issue the appropriate call to the SAF interface.

Note:
1. Specify ALWAYS when you want to control the use of the SPI in all your transactions. Be aware that this might incur additional overhead. The additional overhead is caused by CICS issuing the command security calls on every eligible EXEC CICS command, which are *all* the system programming interface (SPI) commands.
2. If you specify ALWAYS, command checking applies to CICS-supplied transactions such as CESN and CESF. You must authorize all users of CICS-supplied transactions to use the internal CICS resources for the transactions, otherwise you will get unexpected results in CICS-supplied transactions.

Restrictions You can specify the CMDSEC parameter in the SIT, PARM, or SYSIN only.

CONFDATA

The **CONFDATA** parameter specifies whether CICS is to suppress user data that might otherwise appear in CICS trace entries or in dumps.

CONFDATA={SHOW|HIDETC}
This option applies to initial input data received on:
- A z/OS Communications Server RECEIVE ANY operation
- An MRO connection
- An IPIC connection
- FEPI screens and RPLAREAs

This option also applies to the CICS client use of a Virtual Terminal. Data is traced before and after codepage conversion and is suppressed if HIDETC is used in combination with CONFDATA YES in the transaction.

SHOW
Data suppression is not in effect. User data is traced regardless of the CONFDATA option specified in transaction resource definitions. This option overrides the CONFDATA option in transaction resource definitions.

HIDETC
CICS is to 'hide' user transport data from CICS trace entries. The action taken by CICS is subject to the individual CONFDATA attribute on the transaction resource definition (see Table 13 on page 142).

If you specify CONFDATA=HIDETC, CICS processes z/OS Communications Server, MRO, IS, and FEPI user data as follows:

- **z/OS Communications Server**: CICS clears the z/OS Communications Server RAIA containing initial input as soon as it has been processed, and before the target transaction has been identified.

  The normal trace entries (FC90 and FC91) are created on completion of the RECEIVE ANY operation with the text "`SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT`" replacing all the user data except the first 4 bytes of normal data, or the first 8 bytes of function management headers (FMHs).

  CICS then identifies the target transaction for the data. If the transaction definition specifies CONFDATA(NO), CICS traces the user data that it suppressed from the FC90 trace in the trace entry AP FC92. This trace entry is not created if the transaction is defined with CONFDATA(YES).
- **MRO**: CICS does not trace the initial input received on an MRO link.

  The normal trace entries (DD16, DD23, and DD25) are created with the text `SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT` replacing all the user data.

  CICS then identifies the target transaction for the data. If the transaction definition specifies CONFDATA(NO), CICS traces the user data that it suppressed from DD16 in the trace entry AP FC92. This special trace entry is not created if the transaction is defined with CONFDATA(YES).
- **IPIC**: Trace points SO 0201 and SO 0202 suppress buffer data with the message "Trace data suppressed because it may contain sensitive data". Subsequent trace point SO 029D (buffer continuation) and buffer data from trace points WB 0700 and WB 0701 is suppressed.

  If the transaction definition specifies CONFDATA(NO), IS trace entries are created with the user data, as normal.

  If the transaction definition specifies CONFDATA(YES), user data from IS trace points IS 0602, IS 0702, and IS 0906 is replaced with "SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT". Data from IS trace points IS 0603 and IS 0703 is not shown.
- **FEPI**: FEPI screens and RPL data areas (RPLAREAs) areas are suppressed from all FEPI trace points if CONFDATA(YES) is specified in the transaction resource definition. The user data in the FEPI trace points AP 1243, AP 1244, AP 145E, AP 145F, AP 1460, AP

1461, AP 1595, AP 1596, AP 1597, AP 1598, and AP 1599 is replaced with the message `SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT`. If the transaction definition specifies CONFDATA(NO), the FEPI trace entries are created with the user data as normal.

Mirror transactions: The CICS-supplied mirror transaction definitions are specified with CONFDATA(YES). This ensures that, when you specify CONFDATA=HIDETC as a system initialization parameter, CICS regions running mirror transactions suppress user data as described for z/OS Communications Server, MRO, and IS data.

Modified data: By waiting until the transaction has been identified to determine the CONFDATA option, z/OS Communications Server, MRO, or IS data may have been modified (for example, it may have been translated to upper case).

The interaction between the **CONFDATA** system initialization parameter and the CONFDATA attribute on the transaction resource definition is shown in Table 13 on page 142.

Table 15. Effect of CONFDATA system initialization and transaction definition parameters

CONFDATA on transaction	CONFDATA system initialization parameter	
	SHOW	**HIDETC**
NO	Data not suppressed	Data suppressed
YES	Data not suppressed	Data suppressed

You cannot modify the CONFDATA option while CICS is running. You must restart CICS to apply a change.

Restrictions: You can specify the **CONFDATA** parameter in the SIT, PARM, and SYSIN only.

CONFTXT

The **CONFTXT** system initialization parameter specifies whether CICS is to prevent z/OS Communications Server from tracing user data.

CONFTXT={NO|YES}
Valid values are as follows:

NO CICS does not prevent z/OS Communications Server from tracing user data.

YES CICS prevents z/OS Communications Server from tracing user data.

Restrictions You can specify the **CONFTXT** parameter in the SIT, PARM, and SYSIN only.

DFLTUSER

The **DFLTUSER** system initialization parameter specifies the RACF userid of the default user; that is, the user whose security attributes are used to protect CICS resources in the absence of other, more specific, user identification.

DFLTUSER={CICSUSER|userid}
For example, except in the case of terminals defined with preset security, the security attributes of the default user are assigned to terminal users who do not sign on.

The specified userid must be defined to RACF if you are using external security (that is, you have specified the system initialization parameter SEC=YES).

The specified userid is signed on during CICS initialization. If it cannot be signed on, CICS fails to initialize.

Restrictions You can specify the DFLTUSER parameter in the SIT, PARM, or SYSIN only.

PLTPISEC

The **PLTPISEC** system initialization parameter specifies whether or not you want CICS to perform command security or resource security checking for PLT programs during CICS initialization.

PLTPISEC={NONE|CMDSEC|RESSEC|ALL}

The PLT programs run under the authority of the userid specified on PLTPIUSR, which must be authorized to the appropriate resources defined by PLTPISEC.

NONE
You do not want any security checking on PLT initialization programs.

CMDSEC
You want CICS to perform command security checking only.

RESSEC
You want CICS to perform resource security checking only.

ALL You want CICS to perform both command and resource security checking.

Restrictions You can specify the PLTPISEC parameter in the SIT, PARM, or SYSIN only.

PLTPIUSR

The **PLTPIUSR** system initialization parameter specifies the user ID that CICS is to use for security checking for PLT programs that run during CICS initialization.

PLTPIUSR=*userid*

All PLT programs run under the authority of the specified user ID , which must be authorized to all the resources referenced by the programs, as defined by the PLTPISEC parameter.

PLT programs are run under the CICS internal transaction, CPLT. Before the CPLT transaction is attached, CICS performs a surrogate user check against the CICS region userid (the userid under which the CICS region is executing). This is to ensure that the CICS region is authorized as a surrogate for the userid specified on the PLTPIUSR parameter. This ensures that you cannot arbitrarily specify any PLT userid in any CICS region—each PLT userid must first be authorized to the appropriate CICS region.

If you do not specify the PLTPIUSR parameter, CICS runs PLTPI programs under the authority of the CICS region userid, in which case CICS does not perform a surrogate user check. However, the CICS region userid must be authorized to all the resources referenced by the PLT programs.

Restrictions You can specify the PLTPIUSR parameter in the SIT, PARM, or SYSIN only.

PSBCHK

The **PSBCHK** system initialization parameter specifies whether CICS is to perform PSB authorization checks for remote terminal users who use transaction routing to initiate a transaction in this CICS region to access an attached IMS system.

PSBCHK={NO|YES}

Valid values are as follows:

NO The remote link is checked, but no check is made against the remote terminal. This is the default.

YES The remote link is checked, and the remote terminal is also checked if RESSEC(YES) is coded in the definition of the transaction in the CSD.

Restrictions You can specify the **PSBCHK** parameter in the SIT, PARM, or SYSIN only.

Note: If you require DL/I security checking, you must specify the XPSB system initialization parameter as XPSB=YES or XSPB=name. For further information about the XPSB system initialization parameter, see XPSB .

RESSEC

The **RESSEC** system initialization parameter specifies whether you want CICS to honor the RESSEC option specified on a transaction's resource definition.

RESSEC={ASIS|ALWAYS}

Valid values are as follows:

ASIS CICS honors the RESSEC option defined in a transaction's resource definition. CICS calls its resource security checking routine only when RESSEC(YES) is specified in a transaction resource definition. This is normally a sufficient level of control, because often you will need only to control the ability to execute a transaction.

ALWAYS

CICS overrides the RESSEC option, and always calls its resource security checking routine to issue the appropriate call to the SAF interface.

Use this option only if you need to control or audit all accesses to CICS resources. Using this option can significantly degrade performance.

Restrictions You can specify the RESSEC parameter in the SIT, PARM, or SYSIN only.

SEC

The **SEC** system initialization parameter specifies what level of external security you want CICS to use.

SEC={YES|NO}

Valid values are as follows:

YES You want to use full external security. CICS requires the appropriate level of authorization for the access intent: a minimum of READ permission for read intent, and a minimum of UPDATE permission for update intent.

Note: You must also ensure that the default userid (CICSUSER or another user ID specified on the **DFLTUSER** system initialization parameter) has been defined to RACF.

If command security checking is defined for CICS SP-type commands, then specifying SEC=YES means that the appropriate level of authority is checked for; therefore:

- A check for READ authority is made for **INQUIRE** and **COLLECT** commands.
- A check for UPDATE authority is made for **SET**, **PERFORM**, and **DISCARD** commands.

NO You do not want CICS to use an external security manager. All users have access to all resources, whether determined by attempts to use them or by the **QUERY SECURITY** command. Users are not allowed to sign on or off.

Note: With MRO bind-time security, even if you specify SEC=NO, the CICS region user ID is still sent to the secondary CICS region, and bind-time checking is still carried out in the secondary CICS region. For information about MRO bind-time security, see Security checking using the Query Security command in the RACF Security Guide.

Define whether to use RACF for resource level checking by using the **XDCT**, **XFCT**, **XHFS**, **XJCT**, **XPCT**, **XPPT**, **XPSB**, **XRES**, and **XTST** system initialization parameters. Define whether to use RACF for transaction-attach security checking by using the **XTRAN** system initialization parameter. Define whether to use RACF for enterprise bean method authorization checks by using the "XEJB" on page 241 system initialization parameter. Define whether RACF session security can be used when establishing APPC sessions by using the **XAPPC** system initialization parameter.

For programming information about the use of external security for CICS system commands, see Security checking in CICS System Programming Reference.

Restrictions You can specify the **SEC** parameter in the SIT, PARM, or SYSIN only.

Note: If you are using preset terminal security and you perform a warm start with SEC=NO and then again with SEC=YES, you must reinstall the terminal definition to preserve the preset user ID that is replaced by the default user ID when security is switched off. See Preset terminal security in the RACF Security Guide for details.

SECPRFX

The **SECPRFX** system initialization parameter specifies whether CICS is to prefix the resource names in any authorization requests to the external security manager.

SECPRFX={NO|YES|prefix}

Valid values are as follows:

NO CICS does not use prefixes on any resource names.

YES CICS prefixes all resource names with the CICS region user ID. This is the user ID under which the CICS job runs. It is one of the following:

- If CICS is a batch job, it is the user ID corresponding to the USER parameter of the CICS JOB statement.

- If CICS is a started task, it is the user ID associated with the name of the started procedure in the RACF ICHRIN03 table.
- If CICS is a started job, it is the user ID specified in the user parameter of the STDATA segment of a STARTED general resource class profile.

For more information, see the *CICS RACF Security Guide*.

prefix CICS prefixes all resource names with the string you specify. It can be any string of 1 to 8 upper case alphanumeric characters except NO or YES, and must start with an alphabetic character.

Restrictions You can specify the SECPRFX parameter in the SIT, PARM, or SYSIN only.

The SECPRFX parameter is effective only if you specify YES for the SEC system initialization parameter.

SNSCOPE

The **SNSCOPE** system initialization parameter specifies whether a userid can be signed on to CICS more than once, within the scope of a single CICS region, a single MVS image, and a sysplex.

SNSCOPE={NONE|CICS|MVSIMAGE|SYSPLEX}

The signon SCOPE is enforced with the MVS ENQ macro where there is a limit on the number of outstanding MVS ENQs per address space. If this limit is exceeded, the MVS ENQ is rejected and CICS is unable to detect if the user is already signed on. When this happens, the signon request is rejected with message DFHCE3587. You can use the ISGADMIN macro to set or reset the MVS ENQ limit. For more information, see the *z/OS MVS Authorized Assembler Services Reference*.

NONE
Each user ID can be used to sign on for any number of sessions on any CICS region. This is the compatibility option, providing the same signon scope as in releases of CICS before CICS Transaction Server for z/OS, Version 4 Release 2.

CICS Each user ID can be signed on once only in the same CICS region. A signon request is rejected if the userid is already signed on to the same CICS region. However, the user ID can be used to signon to another CICS region in the same, or another, MVS image.

MVSIMAGE
Each userid can be signed on once only, and to only one of the set of CICS regions in the same MVS image that also specify SNSCOPE=MVSIMAGE. A signon request is rejected if the user is already signed on to another CICS region in the same MVS image.

SYSPLEX
Each user ID can be signed on once only, and to only one of the set of CICS regions within an MVS sysplex that also specify SNSCOPE=SYSPLEX. A signon is rejected if the user is already signed on to another CICS region in the same MVS sysplex.

The signon scope (if specified) applies to all user IDs signing on by an explicit signon request (for example, by an EXEC CICS SIGNON command or the CESN transaction). SNSCOPE is restricted to users signing on at local terminals, or signing on after using the CRTE transaction to connect to another system.

Signon scope specified by SNSCOPE does not apply to:

- Non-terminal users.
- The CICS default userid, specified by the **DFLTUSER** system initialization parameter.
- Preset user IDs, specified in the USERID option of the **DEFINE TERMINAL** command.
- User IDs for remote users, received in attach headers.
- User IDs for link security. For information about which userid is used for link security on a specific connection, see the *CICS RACF Security Guide*.
- The user ID specified on the **PLTPIUSR** system initialization parameter.
- The CICS region user ID.

Restrictions You can specify the **SNSCOPE** parameter in the SIT, PARM, or SYSIN only.

XAPPC

The **XAPPC** system initialization parameter specifies whether RACF session security can be used when establishing APPC sessions.

XAPPC={NO|YES}

Valid values are as follows:

NO RACF session security cannot be used.

YES RACF session security can be used.

If you specify BINDSECURITY=YES for a particular APPC connection, a request to RACF is issued to extract the security profile. If the profile exists, it is used to bind the session.

Note: If you specify XAPPC=YES, the external security manager that you use must support the APPCLU general resource class, otherwise CICS fails to initialize.

Restrictions You can specify the XAPPC parameter in the SIT, PARM, or SYSIN only.

XCMD

The **XCMD** system initialization parameter specifies whether you want CICS to perform command security checking, and optionally the RACF resource class name in which you have defined the command security profiles.

XCMD={YES|name|NO}

If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to use a CICS command for the specified resource. Such checking is performed every time a transaction tries to use a COLLECT, DISABLE, DISCARD, ENABLE, EXTRACT, INQUIRE, PERFORM, RESYNC, or SET command, or any of the FEPI commands, for a resource.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the CMDSEC(YES) option on the transaction resource definition.

YES CICS calls RACF, using the default class name of CICSCMD prefixed by C or V, to check whether the userid associated with a transaction is authorized to use a CICS command for the specified resource. The resource class name is CCICSCMD and the grouping class name is VCICSCMD.

name CICS calls RACF, using the specified resource class name prefixed by C or V, to verify that the userid associated with a transaction is authorized to use a CICS command for the specified resource. The resource class name is C*name* and the grouping class name is V*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any command security checks, allowing any user to use commands that would be subject to those checks.

Restrictions: You can specify the **XCMD** parameter in the SIT, PARM, or SYSIN only.

XDCT

The **XDCT** system initialization parameter specifies whether you want CICS to perform resource security checking for transient data queues.

XDCT={YES|name|NO}

If you specify YES or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access the transient data queue. Such checking is performed every time a transaction tries to access a transient data queue.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the RESSEC(YES) option on the transaction resource definition.

YES CICS calls RACF, with the default CICS resource class name of CICSDCT prefixed by D or E, to verify whether the userid associated with the transaction is authorized to access the specified transient data queue.

The resource class name is DCICSDCT and the grouping class name is ECICSDCT.

name CICS calls RACF, using the specified resource class name, to check whether the userid associated with the transaction is authorized to access the specified transient data queue. The resource class name is D*name* and the grouping class name is E*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any transient data security checks, allowing any user to access any transient data queue.

Restrictions: You can specify the XDCT parameter in the SIT, PARM, or SYSIN only.

XEJB

The **XEJB** system initialization parameter specifies whether support of security roles is enabled.

XEJB={YES|NO}

Valid values are as follows:

YES CICS support for security roles is enabled:

- When an application invokes a method of an enterprise bean, CICS calls the external security manager to verify that the userid associated with the transaction is defined in at least one of the security roles associated with the method.
- When an application invokes the `isCallerInRole()` method, CICS calls the external security manager to determine whether the userid associated with the transaction is defined in the role specified on the method call.

NO CICS support for security roles is disabled:

- CICS does not perform enterprise bean method level checks, allowing any userid to invoke any enterprise bean method.
- The `isCallerInRole()` method always returns a value of `true`.

Restrictions:

1. You can specify the XEJB parameter in the SIT, PARM, or SYSIN only.
2. To enable security role support, you must also specify SEC=YES.

XFCT

The **`XFCT`** system initialization parameter specifies whether you want CICS to perform file resource security checking, and optionally specifies the RACF resource class name in which you have defined the file resource security profiles.

`XFCT={YES|name|NO}`

If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access File Control-managed files. Such checking is performed every time a transaction tries to access a file managed by CICS file control. The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

Note: You can specify the **`XFCT`** parameter in the SIT, PARM, or SYSIN only.

YES CICS calls RACF, using the default CICS resource class name of CICSFCT prefixed by F or H, to verify that the userid associated with a transaction is authorized to access files reference by the transaction. The resource class name is FCICSFCT and the grouping class name is HCICSFCT.

name CICS calls RACF, using the specified resource class name, to verify that the userid associated with a transaction is authorized to access files referenced by the transaction. The resource class name is F*name* and the grouping class name is H*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any file resource security checks, allowing any user to access any file.

XHFS

The **`XHFS`** system initialization parameter specifies whether CICS is to check the transaction user's ability to access files in the z/OS UNIX System Services file system.

`XHFS={YES|NO}`

At present, this checking applies only to the user ID of the Web client when CICS Web support is returning z/OS UNIX file data as the static content identified by a URIMAP definition. The checking is performed only if you have specified YES for the SEC system initialization parameter. However, the RESSEC option on the transaction resource definition does not affect this security checking.

Note: You can specify the **XHFS** parameter in the SIT, PARM, or SYSIN only.

YES
CICS is to check whether the user identified as the Web client is authorized to access the file identified by the URIMAP that matches the incoming URL. This check is in addition to the check performed by z/OS UNIX System Services against the CICS region user ID. If access to the file is denied for either of these user IDs, the HTTP request is rejected with a 403 (Forbidden) response.

NO
CICS is not to check the client user's access to z/OS UNIX files. Note that the CICS region user ID's access to these files is still checked by z/OS UNIX System Services.

XJCT

The **XJCT** system initialization parameter specifies whether you want CICS to perform journal resource security checking.

XJCT={YES|name|NO}
If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to access the referenced journal. Such checking is performed every time a transaction tries to access a CICS journal. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC is active for the resource definitions.

Note: You can specify the **XJCT** parameter in the SIT, PARM, or SYSIN only.

YES
CICS calls RACF using the default CICS resource class name of CICSJCT prefixed by a J or K, to check whether the userid associated with a transaction is authorized to access CICS journals referenced by the transaction. The resource class name is JCICSJCT and the grouping class name is KCICSJCT.

name
CICS calls RACF, using the specified resource class name prefixed by J or K, to verify that the userid associated with a transaction is authorized to access CICS journals.

The resource class name specified must be 1 through 7 characters.

NO
CICS does not perform any journal resource security checks, allowing any user to access any CICS journal.

XPCT

The **XPCT** system initialization parameter specifies whether you want CICS to perform started transaction resource security checking, and optionally specifies the name of the RACF resource class name in which you have defined the started task security profiles.

XPCT={YES|name|NO}
If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a transaction is authorized to use started transactions and related EXEC CICS commands. Such checking is performed every time a transaction tries to use a started transaction or one of the EXEC CICS commands: COLLECT STATISTICS TRANSACTION, DISCARD

TRANSACTION, INQUIRE TRANSACTION, or SET TRANSACTION. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

Note: You can specify the **XPCT** parameter in the SIT, PARM, or SYSIN only.

YES CICS calls RACF using the default CICS resource class name CICSPCT prefixed with A or B, to verify that the userid associated with a transaction is authorized to use started transactions or related EXEC CICS commands.

The resource class name is ACICSPCT and the grouping class name is BCICSPCT.

name CICS calls RACF, using the specified resource class name, to verify that the userid associated with a transaction is authorized to use started transactions or related EXEC CICS commands. The resource class name is ACICSPCT and the grouping class name is BCICSPCT.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any started task resource security checks, allowing any user to use started transactions or related EXEC CICS commands.

XPPT

The **XPPT** system initialization parameter specifies that CICS is to perform application program resource security checks and optionally specifies the RACF resource class name in which you have defined the program resource security profiles.

XPPT={YES|name|NO}

You can specify the **XPPT** parameter in the SIT, PARM, or SYSIN only. Checking is performed every time a transaction tries to invoke another program by using one of the CICS commands: LINK, LOAD, or XCTL.

Note: The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.

YES CICS calls RACF, using the default resource class name prefixed by M or N, to verify that the userid associated with a transaction is authorized to use LINK, LOAD, or XCTL commands to invoke other programs. The resource class name is MCICSPPT and the grouping class name is NCICSPPT.

name CICS calls RACF, with the specified resource class name prefixed by M or N, to verify that the userid associated with a transaction is authorized to use LINK, LOAD, or XCTL commands to invoke other programs. The resource class name is M*name* and the grouping class name is N*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any application program authority checks, allowing any user to use LINK, LOAD, or XCTL commands to invoke other programs.

XPSB

The **XPSB** system initialization parameter specifies whether you want CICS to perform program specification block (PSB) security checking and optionally specifies the RACF resource class name in which you have defined the PSB security profiles.

XPSB={YES|name|NO}
You can specify the **XPSB** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to check that the userid associated with a transaction is authorized to access PSBs (which describe databases and logical message destinations used by application programs). Such checking is performed every time a transaction tries to access a PSB.

Note:

1. The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the resource definitions.
2. If you require security checking for PSBs to apply to remote users who access this region by means of transaction routing, the system initialization parameter **PSBCHK**=YES must be specified. For more information about this parameter, see "PSBCHK" on page 197.

YES CICS calls RACF, using the default resource class name CICSPSB prefixed by P or Q, to verify that the userid associated with a transaction is authorized to access PSBs. The resource class name is PCICSPSB and the grouping class name is QCICSPSB.

name CICS calls RACF, using the specified resource class name prefixed by P or Q, to verify that the userid associated with a transaction is authorized to access PSBs. The resource class name is P*name* and the grouping class name is Q*name*.

The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any PSB resource security checks, allowing any user to access any PSB.

XRES

The **XRES** system initialization parameter specifies whether you want CICS to perform resource security checking for particular CICS resources and optionally specifies the general resource class name in which you have defined the resource security profiles.

XRES={YES|*name*|NO}
You can specify the **XRES** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a general resource class name, CICS calls the external security manager to verify that the user ID associated with a transaction is authorized to use the resource. This checking is performed every time a transaction tries to access a resource.

The actual profile name passed to the external security manager is the name of the resource to be checked, prefixed by its resource type; for example, for a document template whose resource definition is named "WELCOME", the profile name passed to the external security manager is DOCTEMPLATE.WELCOME. Even if a command references the document template using its 48-character template name, the shorter name (up to 8 characters) of the DOCTEMPLATE resource definition is always used for security checking.

The checking is performed only if you have specified YES for the **SEC** system initialization parameter and specified the RESSEC(YES) option on the TRANSACTION resource definition.

YES CICS calls the external security manager, using the default CICS resource class name of RCICSRES, to check whether the user ID associated with a transaction is authorized to use the resource it is trying to access. The resource class name is RCICSRES and the grouping class name is WCICSRES.

name CICS calls the external security manager, using the specified resource class name prefixed by the letter R, to check whether the user ID associated with a transaction is authorized to use the resource it is trying to access. The resource class name is R*name* and the grouping class name is W*name*. The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any security checks for resources, allowing access to any user.

For a list of commands subject to XRES resource class checks, together with their respective profiles, see Resource and command check cross reference.

XTRAN

The **XTRAN** system initialization parameter specifies whether you want CICS to perform transaction-attach security checking and optionally specifies the RACF resource class name in which you have defined the transaction security profiles.

XTRAN={YES|*name*|NO}

You can specify the **XTRAN** parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with the transaction is permitted to run the transaction.

Note: The checking is performed only if you have specified YES for the **SEC** system initialization parameter.

YES CICS calls RACF, using the default CICS resource class name of CICSTRN prefixed by T or G, to verify that the userid associated with the transaction is authorized to run the transaction. The resource class name is TCICSTRN and the grouping class name is GCICSTRN.

name CICS calls RACF, using the specified resource class name prefixed by T or G, to verify that the userid associated with the transaction is authorized to run the transaction. The resource class name is T*name* and the corresponding grouping class name is G*name*.

The name specified must be 1 through 7 characters.

NO CICS does not perform any transaction-attach security checks, allowing any user to run any transaction.

XTST

The **XTST** system initialization parameter specifies whether you want CICS to perform security checking for temporary storage queues and optionally specifies the RACF resource class name in which you have defined the temporary storage security profiles.

XTST={YES|name|NO}

You can specify the XTST parameter in the SIT, PARM, or SYSIN only. If you specify YES, or a RACF resource class name, CICS calls RACF to verify that the userid associated with a temporary storage request is authorized to access the referenced temporary storage queue.

Security checking for temporary storage queues is performed only if you have specified all of the following options in addition to the XTST parameter:

- YES for the **SEC** system initialization parameter
- RESSEC(YES) in the relevant TRANSACTION resource definitions
- SECURITY(YES) in your TSMODEL resource definitions
- If you use a temporary storage table (TST), the DFHTST TYPE=SECURITY macro

YES CICS calls RACF, using the default CICS resource class name of CICSTST prefixed by S or U, to verify that the userid associated with the transaction is authorized to access temporary storage queues referenced by the transaction. The resource class name is SCICSTST and the corresponding grouping class name is UCICSTST.

name CICS calls RACF, using the specified resource class name prefixed by S or U, to verify that the userid associated with a transaction is authorized to access temporary storage queues.

The name specified must be 1 through 7 characters.

NO CICS does not perform any temporary storage security checks, allowing any user to access any temporary storage queue.

XUSER

The **XUSER** system initialization parameter specifies whether CICS is to perform surrogate user checks.

XUSER={YES|NO}

You can specify the **XUSER** parameter in the SIT, PARM, or SYSIN only. Valid values are as follows:

YES CICS is to perform surrogate user checking in all those situations that permit such checks to be made; for example, on EXEC CICS START commands without an associated terminal. Surrogate user security checking is also performed by CICS against user IDs installing or modifying DB2 resource definitions that specify AUTHID or COMAUTHID.

Note: The **XUSER** parameter is also used by CICS to control access to the AUTHTYPE and COMAUTHTYPE attributes on DB2 resource definitions, although not through surrogate user checks. For more information about AUTHTYPE and COMAUTHTYPE attributes, see the *CICS Resource Definition Guide*.

For information about the various circumstances in which CICS performs surrogate user checks, see the *CICS RACF Security Guide*.

NO CICS is not to perform any surrogate user checking.

The default system initialization table

This default SIT is in CICSTS42.CICS.SDFHAUTH, and its source, named DFHSIT$$, is in CICSTS42.CICS.SDFHSAMP.

The parameters and values in the macro source statements used to assemble the default system initialization table are listed in Table 16.

Table 16. DFHSIT, the pregenerated default system initialization table

Parameter	Default value	Description
ADI	30	XRF(B) - Alternate delay interval
AIBRIDGE	AUTO	Bridge Autoinstall URM
AICONS	NO	No autoinstall for MVS CONSOLES
AIEXIT	DFHZATDX	Autoinstall user program name
AILDELAY	0	Delete delay period for AI terminals
AIQMAX	100	Maximum number of terminals queued for AI
AIRDELAY	700	Restart delay period for AI terminals
AKPFREQ	4000	Activity keypoint frequency
APPLID	DBDCCICS	z/OS Communications Server APPL identifier
AUTCONN	0	Autoconnect delay
AUTODST	NO	Language Environment automatic storage tuning
AUTORESETTIME	NO	Time-of-day synchronization
AUXTR	OFF	Auxiliary trace option
AUXTRSW	NO	Auxiliary trace autoswitch facility
BMS	FULL, UNALIGN, DDS	Basic Mapping Support options
BRMAXKEEPTIME	86400	Bridge Max Keeptime
CICSSVC	216	The CICS SVC number
CILOCK	NO	Do not keep CI lock after read update
CLSDSTP	NOTIFY	Notification for ISSUE PASS command
CLT		The command list table option or suffix
CMDPROT	YES	Exec storage command checking
CMDSEC	ASIS	API command security checking
CONFDATA	SHOW	Show confidential data in dump and trace
CONFTXT	NO	Do not prevent z/OS Communications Server tracing user data
CPSMCONN	NO	Do not connect to CPSM
CRLPROFILE		Name of profile that allows CICS to access certificate revocation lists
CSDACC	READWRITE	CSD access
CSDBKUP	STATIC	Backup type of CSD (STATIC or DYNAMIC)

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
CSDBUFND		Number of data buffers for the CSD
CSDBUFNI		Number of index buffers for the CSD
CSDDISP		CSD disposition for dynamic allocation
CSDDSN		CSD data set name for dynamic allocation
CSDFRLOG	NO	Journal ID for CSD forward recovery
CSDINTEG	UNCOMMITTED	Read integrity = uncommitted
CSDJID	NO	Journal ID for CSD auto journaling
CSDLSRNO	1	The VSAM LSR pool number for the CSD
CSDRECOV	NONE	CSD recoverable file option
CSDRLS	NO	Use traditional VSAM
CSDSTRNO	6	CSD number of strings
CWAKEY	USER	CWA storage key
DAE	NO	SDUMPS will not be suppressed by DAE
DATFORM	MMDDYY	CSA date format
DB2CONN	NO	Do not connect to DB2 at CICS startup
DBCTLCON	NO	Do not connect to DBCTL at CICS start
DEBUGTOOL	NO	No Debugging Tool access
DFLTUSER	CICSUSER	Default user
DIP	NO	Batch data interchange program
DISMACP	YES	Disable macro programs
DOCCODEPAGE	037	Default host code page
DSALIM	5M	Upper limit of DSA below 16 MB line
DSHIPIDL	020000	Delete shipped idle time
DSHIPINT	120000	Delete shipped interval
DSRTPGM	NONE	Distributed routing program
DTRPGM	DFHDYP	Dynamic routing program
DTRTRAN	CRTX	Default dynamic transaction routing transid
DUMP	YES	Dump option
DUMPDS	AUTO	CICS dump data set opening option
DUMPSW	NO	Dump data set autoswitch option
DURETRY	30	SDUMP total retry time (in seconds)
EDSALIM	48M	Upper limit of DSA above 16 MB line
EJBROLEPRFX		EJB ROLE PREFIX
ENCRYPTION	STRONG	Level of encryption for SSL
EODI	E0	End-of-data indicator for sequential devices
ESMEXITS	NOINSTLN	External security manager exits
FCT	NO	File control table option or suffix
FCQRONLY	YES	Threadsafe FC runs on QR TCB
FEPI	NO	Front-End Programming Interface
FLDSEP		End-of-field separator characters

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
FLDSTRT		Field start character for built-in function
FORCEQR	NO	Do not force QR for threadsafe programs
FSSTAFF	NO	Function-shipped START affinity option
FTIMEOUT	30	File timeout 30 seconds
GMTEXT	'WELCOME TO CICS'	Good-morning message text
GMTRAN	CSGM	Initial transaction
GNTRAN	NO	Signoff transaction
GRNAME		Generic resource name for CICS TORs
GRPLIST	DFHLIST	List name of CSD groups for startup
GTFTR	OFF	GTF trace option
HPO	NO	z/OS Communications Server High Performance Option (HPO)
ICP		Interval control program start option
ICV	1000	Region exit interval (milliseconds)
ICVR	5000	Runaway task interval (milliseconds)
ICVTSD	500	Terminal scan delay interval (")
INITPARM		Initialization parameters for programs
INTTR	ON	CICS internal trace option
IRCSTRT	NO	Interregion communication start
ISC	NO	Intersystem communication option
JESDI	30	JES delay interval for XRF alternate
JVMCCPROFILE		This setting is obsolete. If you specify this parameter, an error warning message is produced (MNOTE4)
JVMCCSIZE	24M	Shared Class Cache size
JVMCCSTART	AUTO	Start Shared Class Cache when needed
JVMPROFILEDIR	/usr/lpp/cicsts /cicsts42/JVMProfiles	JVM profile directory
KEYRING		Key ring to be used by SSL support
LGDFINT	5	Log defer interval in Log Manager
LGNMSG	NO	Extract z/OS Communications Server logon data
LLACOPY	YES	Use MVS LLACOPY support
LPA	NO	Use-LPA option for CICS/user modules
MAXJVMTCBS	5	Maximum number of JVM open TCBs
MAXOPENTCBS	12	Maximum number of open TCBs
MAXSOCKETS	65535	Maximum number of IP sockets
MAXSSLTCBS	8	Limit on number of SSL TCBs
MAXXPTCBS	5	Limit on number of XP TCBs
MCT	NO	Monitoring control table option or suffix
MNIDN	OFF	Monitoring identity class option

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
MN	OFF	CICS monitoring option
MNCONV	NO	Monitoring converse recording option
MNEXC	OFF	Monitoring exception class option
MNFREQ	0	Monitoring frequency period
MNPER	OFF	Monitoring performance class option
MNRES	OFF	Monitoring resource class option
MNSYNC	NO	Monitoring syncpoint recording option
MNTIME	GMT	Monitoring timestamp (GMT or LOCAL)
MQCONN	NO	Do not connect to MQ at startup
MROBTCH	1	Number of MRO requests to batch
MROFSE	NO	Extend lifetime of long-running mirror
MROLRM	NO	Long-running mirror task option
MSGCASE	MIXED	CICS messages in mixed case
MSGLVL	1	System console MSG level option
MXT	5	Maximum number of tasks in CICS
NATLANG	E	List of national languages
NCPLDFT	DFHNC001	Named counter default pool name
NONRLSRECOV	VSAMCAT	Select location of recovery options for non-RLS files
OPERTIM	120	Write to operator timeout (seconds)
OPNDLIM	10	OPNDST/CLSDST request limit
PARMERR	INTERACT	System initialization parameter errors option
PDI	30	Primary delay interval - XRF active
PDIR	NO	DL/I PSB directory option or suffix
PGAICTLG	MODIFY	PG autoinstall catalog state
PGAIEXIT	DFHPGADX	PG autoinstall exit program
PGAIPGM	INACTIVE	PG autoinstall state
PGCHAIN		BMS CHAIN command
PGCOPY		BMS COPY command
PGPURGE		BMS PURGE command
PGRET		BMS RETURN command
PLTPI	NO	Program list table PI option or suffix
PLTPISEC	NONE	No PLT security checks on PI programs
PLTPIUSR		PLT PI userid = CICS region userid
PLTSD	NO	Program list table SD option or suffix
PRGDLAY	0	BMS purge delay interval
PRINT	NO	Print key option
PRTYAGE	32768	Dispatcher priority aging value
PSBCHK	NO	PSB resource checking required

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
PSDINT	0	Persistent session delay interval
PSTYPE	SNPS	z/OS Communications Server single node persistent Sessions
PVDELAY	30	Timeout value for LUIT table
QUIESTIM	240	Timeout value for quiesce requests
RAMAX	256	Maximum I/O area for RECEIVE ANY
RAPOOL	50	Maximum RECEIVE ANY request parm. lists
RENTPGM	PROTECT	Reentrant program write protection
RESP	FME	Logical unit response type
RESSEC	ASIS	Resource security check
RLS	NO	RLS option
RLSTOLSR	NO	RLS files in LSRPOOL build calculation
RMTRAN	CSGM	XRF alternate recovery transaction
RRMS	NO	Recoverable resource management services
RST	NO	Recovery service table (XRF-DBCTL)
RSTSIGNOFF	NOFORCE	XRF - Re-sign on after takeover
RSTSIGNTIME	500	XRF - sign off timeout value
RUWAPOOL	NO	Allocating storage pool for Language Environment
SDTRAN	CESD	Shutdown transaction
SEC	YES	External security manager option
SECPRFX	NO	Security prefix
SKRPA1		SKR PA1 PAGE RETRIEVAL CMD
SKRPA2		SKR PA2 PAGE RETRIEVAL CMD
SKRPA3		SKR PA3 PAGE RETRIEVAL CMD
SKRPF1		SKR PF1 PAGE RETRIEVAL CMD
SKRPF2		SKR PF2 PAGE RETRIEVAL CMD
SKRPF3		SKR PF3 PAGE RETRIEVAL CMD
SKRPF4		SKR PF4 PAGE RETRIEVAL CMD
SKRPF5		SKR PF5 PAGE RETRIEVAL CMD
SKRPF6		SKR PF6 PAGE RETRIEVAL CMD
SKRPF7		SKR PF7 PAGE RETRIEVAL CMD
SKRPF8		SKR PF8 PAGE RETRIEVAL CMD
SKRPF9		SKR PF9 PAGE RETRIEVAL CMD
SKRPF10		SKR PF10 PAGE RETRIEVAL CMD
SKRPF11		SKR PF11 PAGE RETRIEVAL CMD
SKRPF12		SKR PF12 PAGE RETRIEVAL CMD
SKRPF13		SKR PF13 PAGE RETRIEVAL CMD
SKRPF14		SKR PF14 PAGE RETRIEVAL CMD
SKRPF15		SKR PF15 PAGE RETRIEVAL CMD

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
SKRPF16		SKR PF16 PAGE RETRIEVAL CMD
SKRPF17		SKR PF17 PAGE RETRIEVAL CMD
SKRPF18		SKR PF18 PAGE RETRIEVAL CMD
SKRPF19		SKR PF19 PAGE RETRIEVAL CMD
SKRPF20		SKR PF20 PAGE RETRIEVAL CMD
SKRPF21		SKR PF21 PAGE RETRIEVAL CMD
SKRPF22		SKR PF22 PAGE RETRIEVAL CMD
SKRPF23		SKR PF23 PAGE RETRIEVAL CMD
SKRPF24		SKR PF24 PAGE RETRIEVAL CMD
SKRPF25		SKR PF25 PAGE RETRIEVAL CMD
SKRPF26		SKR PF26 PAGE RETRIEVAL CMD
SKRPF27		SKR PF27 PAGE RETRIEVAL CMD
SKRPF28		SKR PF28 PAGE RETRIEVAL CMD
SKRPF29		SKR PF29 PAGE RETRIEVAL CMD
SKRPF30		SKR PF30 PAGE RETRIEVAL CMD
SKRPF31		SKR PF31 PAGE RETRIEVAL CMD
SKRPF32		SKR PF32 PAGE RETRIEVAL CMD
SKRPF33		SKR PF33 PAGE RETRIEVAL CMD
SKRPF34		SKR PF34 PAGE RETRIEVAL CMD
SKRPF35		SKR PF35 PAGE RETRIEVAL CMD
SKRPF36		SKR PF36 PAGE RETRIEVAL CMD
SNSCOPE	NONE	Multiple CICS sessions per userid
SPCTR	(1,2)	Levels of special tracing required
SPOOL	NO	System spooling interface option
SRBSVC	215	HPO Type 6 SVC number
SRT	1$	System recovery table option or suffix
SSLCACHE	CICS	SSL session ID caching
SSLDELAY	600	SSL timeout value
START	AUTO	CICS system initialization option
STARTER	YES	Starter ($ and #) suffixes option **Note:** The default is NO but the parameter must be set to YES here to enable the SIT to assemble correctly.
STATEOD	0	Statistics end-of-day time
STATINT	030000	Statistics interval time
STATRCD	OFF	Statistics recording status
STGPROT	NO	Storage protection facility
STGRCVY	NO	Storage recovery option
STNTR	1	Level of standard tracing required
SUBTSKS	0	Number of concurrent mode TCBs

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
SUFFIX	$$	Suffix of this SIT
SYDUMAX	999	Number of SYSDUMPS to be taken
SYSIDNT	CICS	Local system identifier
SYSTR	ON	Master system trace flag
TAKEOVR	MANUAL	XRF alternate takeover option
TBEXITS		Backout exit programs
TCP	YES	Terminal control program option or suffix
TCPIP	NO	TCP/IP support
TCSACTN	NONE	TC Shutdown action
TCSWAIT	4	TC Shutdown wait
TCT	NO	Terminal control table option or suffix
TCTUAKEY	USER	TCT user area storage key
TCTUALOC	BELOW	TCT user area below 16MB
TD	(3,3)	Transient data buffers and strings
TDINTRA	NOEMPTY	Initial state of transient data queues
TDSUBTASK	OFF	No TD subtasking
TRANISO	NO	Transaction Isolation
TRAP	OFF	F.E. global trap exit option
TRDUMAX	999	Number of TRANDUMPS to be taken
TRTABSZ	4096	Internal trace table size in 1K bytes
TRTRANSZ	16	Transaction dump trace table size
TRTRANTY	TRAN	Transaction dump trace option
TS	(3,3)	Temporary storage buffers and strings
TSMAINLIMIT	64M	Upper limit of storage for TS main queues
TST	NO	Temporary storage table option or suffix
UOWNETQL		Qualifier for NETUOWID
USERTR	ON	Master user trace flag
USRDELAY	30	Timeout value for user directory entries
USSHOME	/usr/lpp/cicsts/ cicsts42	The name and path of the root directory for CICS files on z/OS UNIX
VTAM	YES	z/OS Communications Server access method option
VTPREFIX	\	Client virtual terminal prefix
WEBDELAY	(5,60)	Web timer values
WRKAREA	512	Common work area (CWA) size in bytes
XAPPC	NO	RACF class APPCLU required
XCFGROUP	DFHIR000	XCF group to use for MRO communications
XCMD	YES	SPI use default name for RACF check
XDCT	YES	Security check for transient data queues
XDB2	NO	Security check for DB2ENTRY resources

Table 16. DFHSIT, the pregenerated default system initialization table (continued)

Parameter	Default value	Description
XEJB	YES	EJB security required
XFCT	YES	Security check for files
XHFS	YES	Security check for z/OS UNIX files
XJCT	YES	Security check for journals
XLT	NO	Transaction list table option or suffix
XPCT	YES	Security check for started transactions
XPPT	YES	Security check for programs
XPSB	YES	Security check for DL/I PSBs
XRES	YES	For resources subject to XRES security, checks use the default name for the RACF check. For a list of resources subject to XRES security checks, see the *CICS RACF Security Guide*.
XRF	NO	Extended recovery feature (XRF) option
XTRAN	YES	Security check for transaction-attach
XTST	YES	Security check for temporary storage queues
XUSER	YES	Surrogate user checking to be done

Assembling the SIT

When you have coded the DFHSIT macro, you must assemble the SIT.

About this task

Procedure

1. Assemble and link-edit the table into an APF-authorized library, such as CICSTS42.CICS.SDFHAUTH.
2. Include this library in the STEPLIB concatenation of the CICS startup job stream.

Results

If you code a system initialization parameter in your SIT source, and the parameter's keyword is not defined in the CICS-supplied version of the DFHSIT macro, you get an IEV017 warning message from the assembly, as follows:

```
IEV017  ** WARNING **  UNDEFINED KEYWORD PARAM. DEFAULT TO          POSITIONAL,   INCLUDING KW
```

What to do next

For information about assembling and link-editing CICS control tables, and an explanation of the syntax notation used to describe CICS macros, see the *CICS Resource Definition Guide*.

Selecting versions of CICS programs and tables

A CICS program is usually made up from a group of related CICS functional modules, one example of which is the terminal control program.

About this task

For most CICS programs you can only have one version, which is supplied with CICS. However, for some CICS programs you can create more than one version; for example, with different service levels. To select a particular version of a program, you can include the load library containing that version in the CICS startup JCL. For the basic mapping support (BMS) suite, however, you can select from different versions, by explicitly selecting the level of function needed.

You can also specify that a program is **not** needed (see "Excluding unwanted programs" for details).

You can use these methods **only** for the programs referred to in this section and in "Excluding unwanted programs," by coding system initialization parameters.

Using an explicit level of function to select programs

You use an explicit level of function to select the BMS suite of programs.

When you specify your BMS requirement on the system initialization parameter BMS, you can select one of three versions. The BMS level of function is selected by the parameter options MINIMUM, STANDARD, or FULL, from which the system initialization program loads the set of programs you require.

Excluding unwanted programs

There are three ways to exclude programs that are not required.

You can exclude programs by specifying:
1. programname=NO
2. tablename=NO
3. function=NO

Specifying programname=NO

If you code *programname*system initialization parameter=NO as a , (for example, DIP=NO), you exclude the named management program at CICS system initialization.

The programs that you can exclude by coding *programname*:=NO are
- Batch data interchange program (DIP)
- Terminal control program (TCP)

Note: In the case of DIP, you get a dummy version of the management program, which is supplied on the distribution tape with a suffix of **DY**.

Specifying tablename=NO for the programs control table

Not all of the CICS programs have a programname parameter in the SIT.

Ansystem initialization parameter alternative method is to code NO on the for the associated table. This has the same effect as coding NO against a program name parameter, and the associated CICS program is excluded at system initialization, either by loading a dummy program, or by some other technique.

The system recovery table (SRT) can be used in this way, and the associated system recovery program (SRP) will be excluded.

The dummy TCT, DFHTCTDY

There is a special case where you can also specify tablename=NO, but this does not load a dummy terminal control program. You specify TCT=NO when you are using resource definition online, and all your terminal resource definitions are in the CSD.

When you specify TCT=NO, CICS loads a dummy TCT named DFHTCTDY. A pregeneratedCICSTS42.CICS dummy table of this name is supplied in .SDFHLOAD, and the sourceCICSTS42.CICS statements of DFHTCTDY are supplied in .SDFHSAMP. If you specify TCT=NO, a generated table of this name must be available in a library of the DFHRPL concatenation when you start CICS.

The dummy TCT provides **only** the CICS and z/OS Communications Server control blocks that you need if you are using z/OS Communications Server terminals and using the CSD for storing terminal definitions. You define your z/OS Communications Server terminals using the RDO transaction, CEDA, or the DEFINE command of the CSD batch utility program, DFHCSDUP.

Specifying function=NO

If you code *function*=NO as a system initialization parameter, you exclude the management program associated with the named function at CICS system initialization.

You can exclude functions such as intersystem communication (ISC), the 3270 print-request facility, and the system spooling interface in this way.

Chapter 16. Processing system initialization parameters

This chapter describes the CICS system initialization process.

About this task

It covers:
1. A brief introduction to the process of how you supply system initialization parameters, and the role of the CICS parameter manager domain in this process
2. An explanation of how CICS uses the special system initialization keywords
3. A description of the start and restart classes, and how they are controlled

This chapter describes:
- "Supplying system initialization parameters to CICS"
- "Using system initialization control keywords" on page 290
- "Controlling start and restart" on page 294

Supplying system initialization parameters to CICS

The CICS parameter manager domain loads a system initialization table (SIT) at the start of the initialization process.

About this task

You specify the SIT that defines the CICS characteristics appropriate to your needs by coding the suffix of the DFHSITxx load module (where xx is the suffix) on the SIT= system initialization parameter. If you fail to specify the suffix of a SIT, then CICS tries to load an unsuffixed module.

You can modify many of the system initialization parameters dynamically at the beginning of CICS initialization by providing system initialization parameters in the startup job stream, or through the system console. There are also some system initialization parameters that you cannot code in the SIT, and can only supply at startup time. You specify system initialization parameters at startup time in any of three ways:
1. In the PARM parameter of the EXEC PGM=DFHSIP statement
2. In the SYSIN data set defined in the startup job stream
3. Through the system operator's console

You can use just one of these methods, or two, or all three. However, CICS processes these three sources of input in strict sequence, as follows:
1. The PARM parameter
2. The SYSIN data set (but only if SYSIN is coded in the PARM parameter; see SYSIN)
3. The console (but only if CONSOLE is coded in either the PARM parameter or in the SYSIN data set; see CONSOLE(CN))

Note: If you supply duplicate system initialization parameters, either through the same or a different medium, CICS takes the last one that it reads. For example, if you specify MCT=1$ in the PARM parameter, MCT=2$ in the SYSIN data set, and finally enter MCT=3$ through the console, CICS loads DFHMCT3$.

Using system initialization control keywords

You can use the SYSIN, CONSOLE, and END control keywords at startup to control how CICS is to read system initialization parameters.

About this task

The purpose of these special keywords, and where you can code them, are described as follows:

SYSIN (SI)

This keyword tells CICS to read initialization parameters from the SYSIN data set.

Where to code SYSIN: You can code SYSIN (or SI) only in the PARM parameter of the EXEC PGM=DFHSIP statement. The keyword can appear once only and must be at the end of the PARM parameter. CICS does not read SYSIN until it has finished scanning all of the PARM parameter, or until it reaches a .END before the end of the PARM parameter. (See .END on page END.)

Examples:

```
//stepname   EXEC  PGM=DFHSIP,PARM='SIT=6$,SYSIN,.END'
//stepname   EXEC  PGM=DFHSIP,PARM='SIT=6$,DLI=YES,SYSIN,.END'
```

CONSOLE (CN)

This keyword tells CICS to read initialization parameters from the console. CICS prompts you with message DFHPA1104 when it is ready to read parameters from the console.

Where to code CONSOLE: You can code CONSOLE (or CN) in the PARM parameter of the EXEC PGM=DFHSIP statement or in the SYSIN data set. This keyword can appear either at the end of the PARM parameter or in the SYSIN data set, but code it in one place only.

If you code CONSOLE (or CN) in the PARM parameter, and PARM also contains the SYSIN keyword, CICS does not begin reading parameters from the console until it has finished reading and processing the SYSIN data set. Similarly, wherever you place the CONSOLE keyword in the SYSIN data set, CICS does not begin reading parameters from the console until it has finished reading and processing the SYSIN data set.

Examples:

```
//stepname   EXEC  PGM=DFHSIP,PARM='SIT6$,CONSOLE,.END'
//stepname   EXEC  PGM=DFHSIP,PARM='CONSOLE,SYSIN,.END'
//stepname   EXEC  PGM=DFHSIP,PARM='SIT=6$,CN,SI,.END'
```

If both SYSIN (or SI) and CONSOLE (or CN) appear as keywords of the PARM parameter, the order in which they are coded is irrelevant as long as no other keywords, other than .END, follow them.

.END

The meaning of this keyword varies:

PARM The use of the .END keyword is optional in the PARM parameter. If you omit it, CICS assumes it to be at the end of the PARM parameter. If you code .END in the PARM parameter it can have one of two meanings:

1. If you also code one, or both, of the other control keywords (CONSOLE and/or SYSIN) .END denotes the end of the PARM parameter only.

   For example:
   ```
   //stepname   EXEC  PGM=DFHSIP,PARM='SIT6$,SI,CN,.END'
   ```
2. If you code .END as the only control keyword in the PARM parameter, it denotes the end of all system initialization parameters, and CICS begins the initialization process. For example:
   ```
   //stepname   EXEC  PGM=DFHSIP,PARM='SIT=6$,.END'
   ```

If .END is not the last entry in the PARM parameter, CICS truncates the PARM parameter and the parameters following the .END keyword are lost.

SYSIN

The use of the .END keyword is optional in the SYSIN data set. If you omit it, CICS assumes it to be at the end of SYSIN. If you code .END in the SYSIN data set its meaning depends on your use of the CONSOLE keyword, as follows:

- If you code the CONSOLE control keyword in the PARM parameter or in the SYSIN data set, .END denotes the end of the SYSIN data set only.
- If you do not code the CONSOLE control keyword in the PARM parameter or in the SYSIN data set, .END denotes the end of all CICS system initialization parameters, and CICS begins the initialization process.

If you code .END, and it is not the last entry in the SYSIN data set, or not at the end of a SYSIN record, CICS initialization parameters following the .END are ignored. To avoid accidental loss of initialization parameters, ensure that the .END keyword is on the last record in the SYSIN data set, and that it is the only entry on that line. (However, if you want to remove some system initialization parameters from a particular run of CICS, you could position them after the .END statement just for that run.)

The following example shows the use of .END in a SYSIN data set:
```
//SYSIN   DD  *
* CICS system initialization parameters
SIT=6$,START=COLD,
PDIR=1$,             ( SUFFIX of PSB directory

.END
/*
```

CONSOLE

The meaning of .END through the console depends on whether you are entering new parameters or entering corrections. The two meanings are as follows:

1. If you are keying new parameters in response to message DFHPA1104, .END terminates parameter reading, and CICS starts initialization according to the SIT it has loaded, but modified by any system initialization parameters you have supplied. Until you enter the .END control keyword, CICS continues to prompt you for system initialization parameters.
2. If you have coded PARMERR=INTERACT, and CICS detects a parameter error, either in the keyword or in the value that you

have assigned to it, CICS prompts you to correct the error with message DFHPA1912 or DFHPA1915. If you enter the correct keyword or value, initialization resumes with CICS continuing to process either the PARM parameter, the SYSIN data set, or prompting for more system initialization parameters through the console, depending on where CICS detected the error. If you cannot correct the error, but want CICS to continue with the initialization process, you can enter .END to end the error correction phase.

Processing the PARM parameter

If you omit the **PARM** parameter from the EXEC PGM=DFHSIP statement, CICS assumes that there are no SIT overrides or other initialization parameters and tries to load an unsuffixed module named DFHSIT.

As a general rule, the **PARM** parameter must at least specify the suffix of your system initialization table, using the SIT keyword. Alternatively, you can code the special SYSIN keyword as the only **PARM** parameter, and supply the suffix of your SIT and the other system initialization parameters from the SYSIN data set.

CICS scans the PARM string looking for a **SIT** parameter, any of the special control keywords, or any system initialization parameters, and proceeds as follows:

- If CICS finds a **SIT** parameter but no SYSIN keyword, CICS tries to load the SIT as soon as it has finished scanning the **PARM** parameter. Processing any CICS system initialization parameters that are also present in the **PARM** parameter takes place only after the SIT has been loaded.
- If CICS finds a **SIT** parameter and also a SYSIN keyword, CICS does not try to load the SIT until it has also finished scanning the SYSIN data set. In this case, loading the SIT is deferred because there might be other **SIT** parameters coded in the SYSIN data set that override the one in the **PARM** parameter.

  Processing any system initialization parameters that are also present in the **PARM** parameter takes place only after the SIT has been loaded.

Rules for coding the PARM parameter

The following rules apply when coding the **PARM** parameter:

- The maximum number of characters you can code is 100, excluding the opening and closing delimiters, which can be either apostrophes or parentheses.
- All CICS system initialization parameters must be separated by a comma, and the separating commas are included in the 100 character limit. Because of this limiting factor, you might prefer to limit the use of the **PARM** parameter to specify the SYSIN control keyword only.

The rules for coding the **PARM** parameter on an EXEC job control statement are described fully in *z/OS MVS JCL Reference*.

Processing the SYSIN data set

CICS scans the SYSIN data set looking for a SIT= parameter and any of the special keywords, as well as system initialization parameters.

If CICS finds a SIT= parameter in SYSIN, it tries to load that SIT, overriding any that was specified in the PARM parameter. If CICS does not find a SIT= parameter in SYSIN, it tries to load any SIT specified in the PARM parameter.

However, if after scanning the PARM parameter and the SYSIN data set CICS has not found a SIT= parameter, CICS does one of the following:

1. If you specified CONSOLE in the PARM parameter or in the SYSIN data set, CICS prompts you with the following message to enter the SIT suffix as the first parameter through the console:
   ```
   rr DFHPA1921  DBDCCICS  PLEASE SPECIFY THE REQUIRED SIT SUFFIX, OR
                           SPECIFY 'NONE'(UNSUFFIXED).
   ```
2. If you did not specify CONSOLE, CICS tries automatically to load an unsuffixed SIT module (DFHSIT). If this load fails, CICS issues message DFHPA1106, requesting a SIT suffix in reply to the message.

Note: CICS does not process any system initialization parameters that are coded in the PARM parameter and the SYSIN data set until after the SIT has been loaded.

Rules for coding CICS system initialization parameters in the SYSIN data set

When you code CICS system initialization parameters in the SYSIN data set, observe the following rules.

- You must use a comma to separate parameters that are on the same line.
- You can optionally use a comma at the end of a SYSIN record.
- You can use an asterisk in column 1 to code comments, or to remove an initialization parameter temporarily from a specific execution of CICS.
- You can also add comments after the parameters on a SYSIN line, but they must be preceded by at least one blank character.
- Everything that appears in positions 1 through 80 is treated by CICS as input data.
- You can continue, on another line in SYSIN, parameters that have multiple operands if you make the split immediately after a comma. CICS concatenates the operands, omitting the intervening blanks.
- Generally, you cannot split an individual operand between lines. However, for the GMTEXT parameter, you can enter the operand over more than one line, up to the maximum of 246 characters. The format of this parameter is as follows:
  ```
  GMTEXT='User''s text'
  ```
  You can use apostrophes to punctuate message text, provided that you code two successive apostrophes to represent a single apostrophe (as shown in the example). The apostrophes that delimit the text are mandatory.
- Be careful when you code parameters that use apostrophes, parentheses, or commas as delimiters, because if you do not include the correct delimiters, unpredictable results can occur.

Processing the console entries

Generally, CICS does not begin to read from the console until it has loaded the SIT and processed any initialization parameters that are coded in the PARM parameter and the SYSIN data set. CICS accepts system initialization parameters from the console until you terminate the input with .END.

You can specify a SIT= parameter only as the first parameter through the console when prompted by message DFHPA1921, at which point CICS tries to load the specified SIT. If you try to specify a SIT= parameter after CICS has loaded the SIT it is rejected as an error.

Rules for coding CICS system initialization parameters at the console

When it is ready to read parameters from the console, CICS displays the DFHPA1104 message.

You can enter as many initialization parameters as you can get on one line of the console, but you must use a comma to separate parameters. CICS continues to prompt for system initialization parameters with displays of message DFHPA1105 until you terminate console input by entering the .END control keyword.

Entering corrections to initialization parameters through the console

If you have coded `PARMERR=INTERACT`, and CICS detects a parameter error, either in the keyword or in the value you have assigned to it, CICS prompts you to correct the error with message DFHPA1912 or DFHPA1915.

CICS prompts you to enter corrections to any errors it finds in the **`PARM`** parameter or the SYSIN data set after it has loaded the SIT and as each error is detected. This means that if there is an **`APPLID`** parameter following the parameter that is in error, either in the **`PARM`** parameter or in the SYSIN data set, it is the APPLID coded in the SIT that CICS displays in messages DFHPA1912 and DFHPA1915.

Controlling start and restart

The type of initialization that CICS performs is not only determined by the START parameter.

The CICS local and global catalogs also play a major role in the initialization process, together with any system initialization parameters that you provide, either in the SIT or at run time by one of the three methods described in “Using system initialization control keywords” on page 290..

The role of the CICS catalogs

CICS uses its catalogs to save information between CICS shutdown and the next restart.

The global catalog

CICS uses the global catalog to save all resource definitions that were installed when CICS shut down.

These are:
- BMS maps sets and partition sets
- Connections and sessions
- Files
- LIBRARY concatenations
- Programs
- Terminals and typeterms
- Transactions and transaction profiles
- Transient data queues

The resource definitions that CICS saves at its shutdown might have been installed during a cold start from a list of groups specified by a group list system initialization parameter, or dynamically using RDO when the CICS region is running.

If you run CICS with START=AUTO and a warm or emergency restart results, CICS restores all the installed resource definitions as they were at normal CICS shutdown, or at the time of system failure. If a subsequent error occurs during the restore, appropriate messages are displayed. The general rule is that you cannot alter installed resource definitions during a restart except by coding START=COLD or START=INITIAL. For details of the results of the possible combinations of CICS restart-type and global catalog state, see “Specifying the START system initialization parameter.”

The CICS domains also use the global catalog to save their domain status between runs. In some cases this information can be overridden during a restart by supplying system initialization parameters. In other cases the domain information saved in the catalog is always used in a restart. For example, the CICS statistics interval time is always restored from the catalog in a warm or emergency restart, because the statistics domain does not have this as a system initialization parameter. To change the interval time, you must use CEMT or EXEC CICS commands after control is given to CICS. Alternatively, you can enforce system defaults by performing a cold start.

Note: If you have to reinitialize the global catalog for any reason, you must also reinitialize the local catalog.

The local catalog

The CICS domains use the local catalog to save some of their information between CICS runs.

If you delete and redefine the local catalog, you must:

1. Initialize the local catalog with an initial set of domain records.
2. Use the CICS-supplied utility program, DFHSMUTL, to re-add records to enable the CICS self-tuning mechanism for storage manager domain subpools. For details of how to do this see the *CICS Operations and Utilities Guide*.
3. Delete and reinitialize the global catalog.

For more information about initializing the local catalog, see “Defining the local catalog” on page 65. Some of the information that is saved in the local catalog can be overridden at CICS system initialization by system initialization parameters, such as CICS transaction dump data set status.

Note: If you need to reinitialize the local catalog for any reason, you must also reinitialize the global catalog.

Specifying the START system initialization parameter

You can influence the type of startup that CICS performs, by specifying the **START** system initialization parameter, as follows:

START=AUTO

If you code AUTO as the START operand, CICS determines which of four possible types of start to perform by looking for two records which may or may not be present in the global catalog:

- The recovery manager control record

- The recovery manager autostart override record

Depending on whether either or both of these records exist, and their contents, CICS decides which type of start to perform:

1. Initial start
CICS performs an initial start in each of the following cases:

- There is a recovery manager autostart override record that specifies AUTOINIT in the global catalog.
- The control record specifies an initial start. (This can happen if a previous initial start failed.)

If you set CICS to perform an initial start, you should reinitialize the local catalog before bringing up CICS.

2. Cold start
CICS performs a cold start in the following cases:

- The recovery manager control record specifies a cold start. (This can happen if a previous cold start did not complete.)
- There is both a recovery manager control record (which specifies anything other than an initial start) *and* an autostart override record that specifies AUTOCOLD.

Log records for local resources are purged and resource definitions rebuilt from the CSD or CICS control tables. Units of work on other systems are resynchronized with this system, as described under START=COLD.

3. Warm start
If the recovery manager control record indicates that the previous run of CICS terminated normally with a successful warm keypoint, CICS performs a warm restart—*unless* the autostart override record specifies AUTOINIT or AUTOCOLD, in which case an initial or cold start is performed.

For the warm restart to be successful, the local catalog must contain the information saved by the CICS domains during the previous execution.

A warm start restores CICS to the state it was in at the previous shutdown.

You can modify a warm restart by coding the **NEWSIT** system initialization parameter. This has the effect of enforcing the system initialization parameters coded in the SIT, overriding any cataloged status from the previous CICS shutdown.

The exceptions to this is the system initialization parameter FCT, the CSDxxxxx group (for example CSDACC), and GRPLIST, which are always ignored in a warm restart, even if you specify NEWSIT=YES. Specifying NEWSIT=YES causes, in effect, a partial cold start.

4. Emergency start
If the control record in the global catalog indicates that the previous run of CICS terminated in an immediate or uncontrolled shutdown, CICS performs an emergency restart.

START=AUTO should be the normal mode of operation, with the choice of start being made by CICS automatically. Use the recovery manager utility program, DFHRMUTL, to set overrides.

START=INITIAL

CICS initializes using the resource definitions specified by the system initialization parameters, ignoring any previously installed resource definitions saved in a warm keypoint in the global catalog. This includes all the groups of resources specified by the **GRPLIST** system initialization parameter, and those resources specified in CICS control tables.

Note: The global catalog and system log are initialized, and all information in them is lost. Because recovery information for remote systems is not preserved, damage may be done to distributed units of work

You should rarely need to specify START=INITIAL; if you want to reinstall definitions of local resources from the CSD, use START=COLD instead.

Examples of times when an initial start is necessary are:

- When bringing up a new CICS system for the first time.
- After a serious software failure, when the system log has been corrupted.
- If the global catalog is cleared or reinitialized.
- When you want to run CICS with a dummy system log. (If the system log is defined as a dummy, it is ignored.)

If it is necessary to perform an initial start of CICS, you can do so in two ways:

- By specifying START=INITIAL.
- By using the recovery manager utility program, DFHRMUTL, to set the autostart override record to AUTOINIT, and specifying START=AUTO. For information about DFHRMUTL, see .

START=COLD

CICS initializes using the resource definitions specified by the system initialization parameters, ignoring any previously installed resource definitions saved in a warm keypoint in the global catalog. This includes all the groups of resources specified by the GRPLIST= system initialization parameter, and those resources specified in CICS control tables.

Recovery information relating to remote systems or to RMI-connected resource managers is preserved. The CICS log is scanned during startup, and any information regarding unit of work obligations to remote systems, or to non-CICS resource managers (such as DB2) connected through the RMI, is preserved. (That is, any decisions about the outcome of local UOWs, needed to allow remote systems or RMI resource managers to resynchronize their resources, are preserved.)

Note that, on a cold start, the following are *not* preserved:

- Updates to *local* resources that were not fully committed or backed out during the previous execution of CICS. In particular, although remote systems may resynchronize their units of work successfully, local resources updated in those distributed units of work are not locked and need not be in either a committed or a backed-out state.
- Recovery information for remote systems connected by LU6.1 links, or for earlier releases of CICS systems connected by MRO.
- Any program LIBRARY definitions that had been dynamically defined. Only the static DFHRPL concatenation will remain, together with any LIBRARY definitions in the grouplist specified at startup or installed via BAS at startup.

A start initiated by START=COLD is not entirely without reference to the previous run of a CICS system using the same global catalog. If you want to perform a fully cold start of CICS, without reference to any previous execution, code START=INITIAL. If you want to reinstall definitions of local resources from the CSD, use START=COLD.

There may be times when it is necessary to perform a cold start of CICS, irrespective of the type of system termination that CICS recorded in the global catalog. You can do this in two ways:

- By specifying START=COLD.
- By using DFHRMUTL to set the autostart override record to AUTOCOLD, and specifying START=AUTO.

Table 17 shows how the effect of the START parameter depends on the state of the CICS global catalog and system log.

Note: If the system log is defined as a dummy, it is ignored.

Table 17. Effect of the START= parameter in conjunction with the global catalog and system log

START parm.	**State of global catalog**	**State of system log**	**Result at restart**
Any.	Not defined to VSAM.	Any.	JCL error.
INITIAL	Defined.	Any.	CICS performs an initial start. The global catalog and system log are initialized.
COLD	Defined but contains no recovery manager control record.	Any.	After prompting for confirmation, CICS performs an initial start. The global catalog and system log are initialized.
COLD	Contains recovery manager records.	Not defined or dummy or empty.	Message DFHRM0401 is issued. Startup fails.
COLD	Contains recovery manager records.	Contains records from previous run.	CICS performs a cold start. Recovery records in the system log that relate to changes to local resources are deleted.
AUTO	Defined but contains no recovery manager control record and no AUTOINIT autostart override.	Any.	Message DFHRM0137 is issued. Startup fails.
AUTO	Contains a recovery manager AUTOINIT autostart override.	Any.	CICS performs an initial start, without prompting. The global catalog and system log are initialized.
AUTO	Contains a recovery manager control record that does *not* indicate an initial start, and an AUTOCOLD autostart override.	Contains records from previous run.	CICS performs a cold start. Recovery records in the system log that relate to changes to local resources are deleted.
AUTO	Contains recovery manager records, but no AUTOINIT override.	Not defined or dummy or empty.	Message DFHRM0401 is issued. Startup fails.

Table 17. Effect of the START= parameter in conjunction with the global catalog and system log (continued)

START parm.	State of global catalog	State of system log	Result at restart
AUTO	Contains a recovery manager control record indicating an initial start.	Any.	CICS performs an initial start. The global catalog and system log are initialized.
AUTO	Contains a recovery manager control record indicating a cold start, and no autostart override.	Contains records from previous run.	CICS performs a cold start. Recovery records in the system log that relate to changes to local resources are deleted.
AUTO	Contains a recovery manager control record indicating an emergency start, and no autostart override.	Contains records from previous run.	CICS performs an emergency start.
AUTO	Contains a recovery manager control record indicating a warm start, and no autostart override.	Contains records from previous run.	CICS performs a warm start.

Note:

1. It is important to keep the CICS global and local catalogs in step. If CICS tries to perform a warm or emergency start and finds that the local catalog has been initialized, startup fails. Therefore, only initialize the local catalog at the same time as the global catalog.
2. It is recommended that you always run the DFHRMUTL and DFHCCUTL utilities in the same job. Run DFHRMUTL first and check its return code before running DFHCCUTL. If you do this, the global and local catalogs should never get out of step. For information about running DFHRMUTL and DFHCCUTL, see the *CICS Operations and Utilities Guide*.

Table 18 shows the effect of different types of CICS startup on the CICS trace, monitoring, statistics, and dump domains.

Table 18. Effect of the type of startup on CICS domains

Domain	State of the CICS catalogs	Warm or emergency start	Initial or cold start
Trace	Not relevant.	Domain initializes according to the system initialization parameters.	Domain initializes according to the system initialization parameters.
Monitoring	The global catalog is newly initialized.	Domain initializes according to the system initialization parameters.	Domain initializes according to the system initialization parameters.
Monitoring	The global catalog contains status of monitoring at the previous CICS shutdown.	Domain uses monitoring status from the catalog, but modified by any system initialization override parameters.	Domain initializes according to the system initialization parameters.
Statistics	The global catalog is newly initialized.	Domain initializes according to CICS-defined system default values.	Domain initializes according to CICS-defined system default values.

Table 18. Effect of the type of startup on CICS domains (continued)

Domain	State of the CICS catalogs	Warm or emergency start	Initial or cold start
Statistics	The global catalog contains status of statistics at CICS shutdown.	Domain uses statistics status from the catalog.	Domain initializes according to CICS-defined system default values.
Dump	The global catalog is newly initialized.	Domain initializes the dump table according to CICS-defined system default values. Other dump attributes are set by system initialization parameters.	Domain initializes an empty dump table, and takes CICS-defined default action for all dump requests. Other dump attributes are set by system initialization parameters.
Dump	The global catalog contains dump status at CICS shutdown.	Domain reads the dump table and dump status from the catalog. Other dump attributes are modified by any system initialization parameters.	Domain initializes an empty dump table, and takes CICS-defined default action for all dump requests. Other dump attributes are set by system initialization parameters.

CICS startup and the z/OS Communications Server session

In an SNA network, the session between CICS and the z/OS Communications Server is started automatically if the Communications Server is started before CICS.

If the z/OS Communications Server is not active when you start CICS, you receive the following messages:

```
F vtamname,USERVAR,ID=generic-applid,VALUE=specific-applid
+DFHSI1589D 'applid' VTAM is not currently active.
+DFHSI1572 'applid'  Unable to OPEN VTAM ACB - RC=xxxxxxxx, ACB CODE=yy.
```

If you receive messages DFHSI1589D and DFHSI1572, you can start the CICS-z/OS Communications Server session manually when the Communications Server eventually started, by using the **CEMT SET VTAM OPEN** command from a supported MVS console or a non-Communications Server terminal.

If the z/OS Communications Server is active, but CICS still cannot open the SNA ACB because Communications Server does not recognize the CICS APPLID, you receive the following messages:

```
F vtamname,USERVAR,ID=generic-applid,VALUE=specific-applid
+DFHSI1592I 'applid' CICS applid not (yet) active to VTAM.
+DFHSI1572  'applid' Unable to OPEN VTAM ACB - RC=00000008, ACB CODE=5A.
```

This might be caused by an error in the value of APPLID operand, in which case you must correct the error and restart CICS. For information about other causes and actions, see .

The CICS parameter manager domain

In addition to loading the system initialization table at the start of initialization, and reading any other parameters from PARM, SYSIN, or the system console, the parameter manager domain is responsible for the management of the SIT.

With the exception of the application domain (AP) which uses the SIT directly, the parameter manager domain passes system initialization parameters to the other CICS domains on request.

The domain initialization process is as follows:

Query the type of startup
With the exception of the trace domain, each domain asks the parameter manager for the type of startup—initial, cold, or warm. (For this purpose, the parameter manager domain treats an emergency restart as a warm start.)

Startup is initial or cold
If startup is initial or cold, domains do not read their domain records from the catalogs. Instead, they request system initialization parameters from the parameter manager domain. Because it is a cold start, the parameter manager domain returns all system initialization parameters from the SIT, modified by any overrides.

Startup is warm
If startup is warm, domains try to perform a warm start by reading their domain records from the catalogs:

- If they succeed in reading their status records, domains perform a warm start. Where applicable, they also request system initialization parameters from the parameter manager domain. Because it is a warm start, the parameter manager domain returns only those system initialization parameters supplied as overrides by PARM, SYSIN, or the system console.
- If they fail for any reason to read their status records, domains perform a cold start. They do this either by requesting **all** system initialization parameters from the parameter manager domain, or by using system default values if the domain does not have any system initialization parameters.

NEWSIT or new suffix
Although a START=AUTO may resolve to a warm start, parameter manager enforces most system initialization parameters if:

- You specify NEWSIT=YES as a system initialization parameter in PARM, SYSIN, or through the console.
- You specify a different SIT suffix from the previous run of CICS. Parameter manager saves the suffix from each run in the global catalog, and, if it detects a new suffix, it forces the NEWSIT=YES option.

For details of the parameters that are ignored when you specify NEWSIT=YES, see the NEWSIT parameter description on page NEWSIT.

Note: The trace domain is an exception to the above rules in that it always cold starts. Trace does not save its status at CICS shutdown like the other domains, and regardless of the type of startup, it requests **all** of its system initialization parameters from the parameter manager domain.

End of CICS startup

Whichever type of startup is performed, when the DFHSI1517 message is displayed on the operating system console, CICS is ready to process terminal requests.

When the startup process is completed, users are able to enter transactions from any terminals that are connected to CICS. For information about the CICS-supplied transactions, see *CICS Supplied Transactions*.

Chapter 17. Retrieving information about system initialization parameters

You can use the CICSPlex SM API to discover information about CICS system initialization parameters and system initialization parameter overrides. System initialization parameter retrieval is supported by the CICSPlex SM command-level interface, the CICS management client interface (CMCI), and the Web User Interface (WUI).

When you retrieve parameters you have the following options:

- You can retrieve the current values of the system initialization parameters including any override values.
- You can retrieve the original system initialization parameter values as specified at system startup.
- You can retrieve the values from a single override source.

In common with many other CICSPlex SM operations, you can control which CICS regions the retrieval operates on by specifying context and scope.

System initialization parameter retrieval is implemented using the CICSPlex SM resource SYSPARM. The SYSPARM resource has two required parameters, **PARMSRCE** and **PARMTYPE**, associated with the GET operation. You use these parameters to specify which parameters to retrieve according to their source.

You can implement system initialization parameter discovery in three ways:

- In an API program using the **EXEC CPSM GET** command operating on the SYSPARM object.
- Using the **CMCI GET** method operating on the CICSSystemParameter external resource.
- Using the WUI operations view based on the SYSPARM resource table linked from the CICS region view set.

When you use **EXEC CPSM GET** command or CMCI, you can define a parameter expression using **PARMSRCE** and **PARMTYPE** to specify which parameters to retrieve. In the WUI you can use **PARMSRCE** and **PARMTYPE** as filters to control the records displayed. Both of these parameters are mandatory. For **PARMTYPE**, you must specify a value of SIT. For **PARMSRCE**, specify one of the following options:

COMBINED
Combination of the original system initialization parameter definitions and any applied parameter overrides

CONSOLE
Override parameters as specified at startup on the system console

JCL
Override parameters provided through a JCL EXEC PGM statement

SYSIN
Override parameters from the startup job stream defined in the SYSIN data set

TABLE
The original system initialization table values extracted from the DFHSIT*xx* load module

The parameters and override values are returned in the order of the KEYWORD attribute of the SYSPARM resource table irrespective of their order in the source, for example the SYSIN data set.

System parameter values can exceed 255 bytes. In these cases the parameter value is split into multiple records each containing a maximum of 255 bytes of parameter value. Each record has a unique segment number, which can be used to order the records correctly, a total segment number which contains the number of segments for this parameter value, and a total value length field, which contains the overall length of the segment lengths added together.

You must ensure that the system initialization parameters to be retrieved were valid for the CICS region at CICS startup. The retrieval operation can behave inconsistently if invalid parameter values have been corrected from the console at startup. Some parameters show the corrected values while others display their original values. Additionally for some corrected values, the system parameter source location might be returned as the console instead of the original source location.

This CMCI request retrieves the values of the control tables suffixes set to for region `REGION` in the CICSplex `MYPLEX`.

```
/CICSSystemManagement/CICSSystemParameter/<MYPLEX>/<REGION>?PARAMETER=PARMSRCE(COMBINED)
%20PARMTYPE(SIT)&CRITERIA=KEYWORD%3D++T%20AND%20NOT%20KEYWORD%3DMXT
```

Chapter 18. CICS startup

Depending on your system environment, you can start the CICS job from a procedure by using the **START** command, or you can submit the CICS startup job stream through the internal reader.

About this task

For an example of a batch job that you can submit through the internal reader, see "A sample CICS startup job" on page 308. "A sample CICS startup procedure" on page 319 gives an example of a cataloged procedure suitable for starting CICS as a started task.

When you run the startup job, you start a process called **CICS system initialization**. This process must finish before you run any transactions. Completion of CICS initialization is shown by the following message at the system console:

```
DFHSI1517 - applid:  Control is being given to CICS.
```

CICS initialization involves many activities, some of which are:

- Obtaining the required storage for CICS execution from the private area in the CICS address space, above and below the 16MB line.
- Setting up CICS system parameters for the run, as specified by the system initialization parameters.
- Loading and initializing the CICS domains according to the start option specified by the **START**= system initialization parameter.
- Loading the CICS nucleus with the required CICS modules.
- Installing CICS resource definitions by:
  - Loading, from the CSD, the groups of resources specified by the **GRPLIST**= system initialization parameter
  - Loading the control tables specified by system initialization parameters
- Opening the data sets necessary for initialization, including any needed for backout if the previous run of your CICS region was not shut down normally. Data sets may also be opened for backout even after a successful shutdown, if they had suffered backout failures before the CICS shutdown, because failed backouts are retried at emergency restart.
- Opening BSAM sequential devices as required in the terminal control table (TCT).

Also, if you are operating CICS with CICS recovery options, backout procedures may be used to restore recoverable resources to a logically consistent state. For example, backout can occur if you start CICS with START=AUTO and CICS detects that the previous shutdown was immediate or uncontrolled. With SDTRAN, an immediate shutdown does not always leave in-flight units of work to be backed out. Also, even if there were no in-flight UOWs, it is possible (although rare) that there were backout-failed UOWs for which backout will be retried.

For background information about backout, and recovery and restart, see Recovery and restart overview in the Recovery and Restart Guide.

In the final stages of initialization, a set of programs can be executed as specified in a program list table (PLT). You specify the suffix of the PLT you want by means of the PLTPI parameter in the SIT. Initialization PLT programs run under control of a CICS task in CICS key. Their storage is in CICS-key storage, and protected from overwriting by other transactions.

The PLTPI resource managers start up in the following sequence when specified in the system initialization table:

1. CPSMCONN=CMAS
2. CPSMCONN=LMAS
3. CPSMCONN=WUI
4. DBCTLCON=YES
5. DB2CON=YES
6. MQCON=YES

This sequence only applies to the above system initialization parameters and not for PLTPI programs in general.

For programming information about writing PLT programs, see the *CICS Customization Guide*.

If you are running CICS with DB2, you can specify the DB2 subsystem ID to be used at PLT startup by the **INITPARM** system initialization parameter, as follows:

```
INITPARM=(DFHD2INI='yyyy')
```

where `yyyy` is the 4-character DB2 subsystem ID. The value must conform to MVS JCL rules about special characters. You cannot use the ID of a data sharing group of DB2 subsystems on the **INITPARM** system initialization parameter — you must specify the ID of a single DB2 subsystem. If you want to use the **INITPARM** system initialization parameter to specify a DB2 subsystem, leave blank both the DB2GROUPID and the DB2ID in the installed DB2CONN definition. An ID specified in either of these attributes of the DB2CONN definition overrides an ID specified on the **INITPARM** system initialization parameter.

Setting address space storage limits for a CICS region

When you submit your CICS job, set the z/OS parameters **REGION** and **MEMLIMIT** to specify the amount of virtual storage for the address space in which CICS runs.

About this task

You cannot alter the **REGION** and **MEMLIMIT** values for the CICS region while CICS is running. You can specify new values only when you start the CICS region.

The **REGION** parameter specifies your request for an amount of 24-bit and 31-bit storage, that is, storage below the bar, for the CICS address space. Up to 2047 MB of storage can be requested, but you must leave enough storage below the bar for the system region in 24-bit storage, and items in the high private area such as the local system queue area (LSQA). You can specify the **REGION** parameter in different ways to request a specific amount of storage, or all the available 24-bit or 31-bit private storage. The resulting region size below the bar can be unpredictable.

The **MEMLIMIT** parameter specifies the limit of 64-bit (above-the-bar) storage for the CICS region. A CICS region needs a **MEMLIMIT** value of at least 4 GB. The default value in z/OS for **MEMLIMIT** is 2 GB.

Procedure

1. Calculate the amount of 24-bit (below-the-line) storage and 31-bit (above-the-line) storage to request on the **REGION** parameter. See "Estimating and setting REGION" in the *CICS Performance Guide*.
2. Specify a suitable **REGION** parameter for the CICS region. You can set **REGION** in the following ways:
   - You can specify the **REGION** parameter in the JOB statement in the CICS JCL. In this situation, each step of the job runs in the requested amount of space.
   - You can specify the **REGION** parameter in the EXEC statement (program execution line) for CICS. In this situation, each step runs in its own amount of space. Use the EXEC statement instead of the JOB statement if different steps need greatly different amounts of space. For example, use the EXEC statement if you are using extra job steps to print auxiliary trace data sets after CICS has shut down (as in the DFHIVPOL installation verification procedure).
   - The z/OS installation exit IEFUSI can limit the **REGION** value that you specify. For information about IEFUSI, see "IEFUSI — Step Initiation Exit" in *z/OS MVS Installation Exits*.

   For further details about specifying the **REGION** parameter, and information about the amount of storage that z/OS allocates in response to your request, see "REGION Parameter" in *z/OS MVS JCL Reference*.
3. Calculate the amount of 64-bit (above-the-bar) storage that you need to specify with the **MEMLIMIT** parameter. This amount depends on the facilities that you plan to use. See "Estimating, checking, and setting MEMLIMIT" in the *CICS Performance Guide*.
4. Identify the **MEMLIMIT** value that applies to your CICS region, and change it if necessary. You can set **MEMLIMIT** in the following ways:
   - A **MEMLIMIT** value can be specified in the JOB statement in the CICS JCL, or in the EXEC statement (program execution line) for CICS.
   - If there is no **MEMLIMIT** value specific to the CICS region, the **MEMLIMIT** value that is set in the z/OS SMFPRM*xx* PARMLIB member, or the system default, applies.
   - The z/OS installation exit IEFUSI can override any other **MEMLIMIT** values.

   The following example shows a **MEMLIMIT** value set in the program execution line:

   ```
   //CICS EXEC PGM=DFHSIP,PARM='SI',REGION=0M,MEMLIMIT=4G
   ```

   For further details about changing a **MEMLIMIT** value in z/OS, or determining the value that applies to the CICS region that you are setting up, see "Limiting the use of memory objects" in the *z/OS MVS Programming: Extended Addressability Guide*.

Using the sample startup job stream

You can use the sample job control statements to initialize a CICS region.

About this task

The sample startup job stream is based on the system initialization parameters contained in the CICS-supplied sample table, DFHSIT6$.

For more information about the DD statements in this job stream that are needed by CICS and IMS, see the appropriate section in Part 1, “Defining data sets,” on page 1.

JCL similar to that in “A sample CICS startup job” is supplied as a sample startup procedure, DFHSTART, in the CICSTS42.CICS.SDFHINST library. You can use the DFHSTART procedure to start the CICS regions, or as a basis for your own startup procedures. For information about the DFHSTART procedure, see CICS startup procedure, DFHSTART in the Installation Guide.

A sample CICS startup job

You can use the sample CICS startup job to help you determine and adjust values needed for CICS startup parameters.

The EXEC statement contains the **REGION** parameter to define the size of CICS region. In this example, the value is set to 240, requesting MVS to allocate to the job all 16 MB of private storage below the 16 MB line and an extended region size of 240 MB.

```
/*
//* 1   The JOB statement
//CICSRUN  JOB accounting info,name,CLASS=A,
//            MSGCLASS=A,MSGLEVEL=(1,1),NOTIFY=userid
//*
//* 2   The JOBPARM statement
/*JOBPARM SYSAFF=sysid
/*
//***********************************************************
//*******************  EXECUTE CICS  ************************
//***********************************************************
//*
//* 3   The EXEC CICS=DFHSIP statement
//CICS    EXEC PGM=DFHSIP,REGION=240M,
//* 4   System initialization parameters specified on PARM parameter
//             PARM=('SIT=6$',
//             'DSALIM=6M,EDSALIM=120M',
//             'RENTPGM=PROTECT,STGPROT=YES',
//             'START=AUTO,SI')
//*
//* 5   System initialization parameters specified on the SYSIN data set
//SYSIN    DD *
GRPLIST=(DFHLIST,userlist1,userlist2),
LPA=YES,
APPLID=CICSHTH1,
DFLTUSER=CICSUSER,   The default user ID
MXT=30,              Maximum number of user tasks is 30
INITPARM=(DFHDBCON='01',DFHD2INI=('MYDB')),
                     Pass DFSPZP01 suffix to DBCTL connect program
                     Connect to DB2 subsystem MYDB
ISC=YES,             Include intersystem communication program
IRCSTRT=YES,         Start interregion communication
.END
/*
//* 6   The STEPLIB library
//STEPLIB  DD  DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR
//         DD  DSN=CICSTS42.CICS.SDFJAUTH,DISP=SHR
//         DD  DSN=CEE.SCEERUN2,DISP=SHR
//         DD  DSN=CEE.SCEERUN,DISP=SHR
//*
//* 7   The CICS library (DFHRPL) concatenation
//DFHRPL   DD DSN=CICSTS42.CICS.SDFHLOAD,DISP=SHR
//*        Your application library
//         DD  DSN=your.prog.library,DISP=SHR
//*        Your CICS control tables library
//         DD  DSN=your.table.library,DISP=SHR
//*        The Language Environment run-time data sets
//         DD  DSN=CEE.SCEECICS,DISP=SHR
//         DD  DSN=CEE.SCEERUN2,DISP=SHR
//         DD  DSN=CEE.SCEERUN,DISP=SHR
//*        The Debug Tool runtime library
//         DD  DSN=EQA.SEQAMOD,DISP=SHR
//* 7a     The DB2 load library
//         DD  DSN=SYS2.DB2.SDSNLOAD,DISP=SHR
//* 8   Auxiliary temporary storage data sets
//DFHTEMP  DD DSN=CICSTS42.CICS.CNTL.CICSHTH1.DFHTEMP,DISP=SHR
//*
//* 9   Intrapartition data sets
//DFHINTRA DD DSN=CICSTS42.CICS.CNTL.CICSHTH1.DFHINTRA,DISP=SHR
//*
//* 10   The auxiliary trace data sets
//DFHAUXT  DD DSN=CICSTS42.CICS.CICSHTH1.DFHAUXT,DISP=SHR
//DFHBUXT  DD DSN=CICSTS42.CICS.CICSHTH1.DFHBUXT,DISP=SHR
//*
```

Figure 27. CICS startup job stream

```
//* 11   Extrapartition data sets
//DFHCXRF  DD SYSOUT=*
//LOGUSR   DD SYSOUT=*,DCB=(DSORG=PS,RECFM=V,BLKSIZE=136)
//MSGUSR   DD SYSOUT=*,DCB=(DSORG=PS,RECFM=V,BLKSIZE=140)
//COUT     DD SYSOUT=*,DCB=(DSORG=PS,RECFM=V,BLKSIZE=137)
//CEEMSG   DD SYSOUT=A
//CEEOUT   DD SYSOUT=A
//*
//* 12   The CICS local catalog data set
//DFHLCD   DD DSN=CICSTS42.CICS.CICSHTH1.DFHLCD,DISP=SHR
//* 13   The CICS global catalog data set
//DFHGCD   DD DSN=CICSTS42.CICS.CICSHTH1.DFHGCD,DISP=SHR,
//            AMP=('BUFND=33,BUFNI=32,BUFSP=1114112')
//*
//* 14   The transient data destination data set (CXRF)
//DFHCXRF  DD SYSOUT=A
//*
//* 15   The CICS transaction dump data sets
//DFHDMPA  DD DSN=CICSTS42.CICS.CICSHTH1.DFHDMPA,DISP=SHR
//DFHDMPB  DD DSN=CICSTS42.CICS.CICSHTH1.DFHDMPB,DISP=SHR
//*
//* 16   MVS system dump data sets
//SYSABEND DD SYSOUT=*
//SYSMDUMP DD  DSN=SYS1.SYSMDP00,VOL=SER=volid,SPACE=(CYL,(1,1)),
//             DISP=OLD,UNIT=3380
//* SYSUDUMP DD SYSOUT=*
//*
//* 16a   Default stdout file for C-language system services used by CICS
//SYSPRINT DD SYSOUT=*
//* 17   The CICS system definition data set
//DFHCSD   DD DSN=CICSTS42.CICS.DFHCSD,DISP=SHR
//*
//* 18   The CICS BTS local request queue data set
//DFHLRQ   DD DSN=CICSTS42.CICS.DFHLRQ,DISP=SHR
//*
//* 19   The EJB directory and object store data sets
//DFHEJDIR DD DSN=CICSTS42.CICS.DFHEJDIR,DISP=SHR
//DFHEJOS  DD DSN=CICSTS42.CICS.DFHEJOS,DISP=SHR

//* 20   The CMAC data file
//DFHCMACD DD DSN=CICSTS42.CICS.DFHCMACD,DISP=SHR
//*
//* 21   The CDBM group command file
//DFHDBFK  DD DSN=CICSTS42.CICS.DFHDBFK,DISP=SHR
//*
//* 22   FILEA & other permanently allocated data sets
//* (The FILEA DD statement below overrides the CSD definition in
//*  group DFHMROFD)
//FILEA    DD DISP=SHR,
// DSN=CICSTS42.CICS.CICSHTH1.FILEA
//*
//APPLICA  DD  DSN=CICSTS42.CICS.CICSHTH1.APPLICA,DISP=SHR
//APPLICB  DD  DSN=CICSTS42.CICS.CICSHTH1.APPLICB,DISP=SHR
//*
//*
//* 23
//PRINTER  DD  SYSOUT=A,DCB=BLKSIZE=125,OUTLIM=0
//CARDIN   DD  *

\user transactions input from sequential terminal \

\CESF GOODNIGHT\
/*
```

1. The JOB statement specifies the accounting information that you want to use for this run of CICS. For example:

   ```
   //CICSRUN  JOB 24116475,userid,MSGCLASS=A,MSGLEVEL=(1,1),
   //         CLASS=A,NOTIFY=userid
   ```

2. The JES JOBPARM statement is included to identify the MVS image on which this CICS (the active CICS region) is to run.
3. DFHSIP is the program that starts CICS initialization. CICS does not support more than one EXEC PGM=DFHSIP job step in the same MVS job.

   To determine how much of the allocated private storage CICS gives to dynamic storage areas and leaves for demands on operating system storage, set values for the **DSALIM** and **EDSALIM** system initialization parameters. After obtaining the amount of space required for the DSAs from the total defined by the **REGION** parameter, the remaining storage is available to meet demands for operating system storage.

   In this sample job stream, these system initialization parameters are specified in the **PARM** parameter.

   For more details about the **REGION** parameter and CICS storage, see “Setting address space storage limits for a CICS region” on page 306.

   If you are running CICS with RACF support, see the RACF security overview in the RACF Security Guide for information about parameters related to RACF.
4. You can use the **PARM** parameter of the EXEC statement to specify system initialization parameters as shown.

   The information passed by the **PARM** parameter is limited to 100 characters. This limit includes all commas, but excludes the apostrophes delimiting the **PARM** strings, and excludes the opening and closing parentheses delimiting the **PARM** parameter. Internal parentheses enclosing system initialization operands are included. If 100 characters are not sufficient for the system initialization parameters that you want to provide at startup, indicate continuation by ending the **PARM** field with the SYSIN or CONSOLE control keywords, or SI or CN for short. If you specify SYSIN, system initialization parameters are read from the SYSIN data set; if you specify CONSOLE, CICS prompts you to enter parameters through the console. However, if all of your runtime system initialization parameters are in the **PARM** parameter, you can end the PARM field without any control keywords, or by the END control keyword.

   In this example, CICS uses the values in the DFHSIT6$ system initialization table, modified by the system initialization parameters supplied in the PARM field and the SYSIN data set. For this example, the following system initialization parameters are provided in the **PARM** parameter:

   RENTPGM

   Storage for the read-only DSAs, RDSA and ERDSA, is obtained from key-0, non-fetch protected storage by using the default PROTECT option on the **RENTPGM** system initialization parameter. Specify RENTPGM=NOPROTECT for development CICS regions and RENTPGM=PROTECT for production CICS regions. For more information about the **RENTPGM** parameter, see “RENTPGM” on page 201.

   STGPROT

   Storage protection is obtained for this run of CICS by specifying YES on the **STGPROT** system initialization parameter. Before using this parameter, check with the *Program Directory for CICS Transaction Server* *for z/OS* that you have the required hardware and software. See "STGPROT" on page 219 for details about the **STGPROT** parameter itself.

START
: START=AUTO is normally the type of start that you select for a production CICS system, so that CICS can determine the type of start to be performed.

SI
: The PARM statement ends with SI (short for SYSIN), to tell CICS to continue reading overrides from the SYSIN data set.

5.

You can include the SYSIN data set inline as part of the job stream. System initialization parameters entered in the SYSIN data set replace any that were entered in the **PARM** parameter for the same keyword. If you include the same parameter more than once, the *last* value read is the value used for initialization except for INITPARM. If you specify the INITPARM keyword and its parameters more than once, each one is accepted by CICS, for example:

```
* The following INITPARM parameters are for DBCTL and a user program
INITPARM=(DFHDBCON='XX,DBCON2',userprog='a,b,c')
* The following INITPARM parameter is for DB2
INITPARM=(DFHD2INI= 'DBA2')
```

Unless you explicitly code the system initialization control keyword CONSOLE, CICS stops reading system initialization parameters when it reaches the end of SYSIN or the END control keyword.

In the sample job, CONSOLE is not coded in either PARM or SYSIN. The END control keyword is the last entry in SYSIN, so CICS does not prompt through the console for further system initialization parameters. After reading the SYSIN data set, CICS loads the specified SIT, applies any system initialization parameters supplied in the PARM field and the SYSIN data set, and begins the initialization process.

The SYSIN data set in this example includes several system initialization parameters:

GRPLIST
: The group list defined in DFHSIT6$ is DFHLIST, the list that is generated when you initialize the CSD using the **DFHCSDUP INITIALIZE** command. DFHLIST contains only the standard resource definitions required by CICS. One of the group lists specified on the **GRPLIST** system initialization parameter must contain those resource definitions required by CICS. You can either include the resource definitions in one of your own group lists or specify the DFHLIST explicitly. Your own group lists (userlist1 and userlist2 in the example) must contain all the resource definitions generated by your installation for your CICS applications. In addition, your group lists must contain any definitions required for IBM licensed programs that you are using, such as COBOL or DB2.

LPA
: The SIT specifies that modules are not to be used from the link pack area; LPA=YES in SYSIN specifies that modules are to be used from the LPA in this run.

APPLID
: The APPLID for this CICS region is CICSHTH1. If you want this CICS region to use z/OS Communications Server for terminal access or ISC communication, define this APPLID to z/OS Communications Server.

CICSID is the generic APPLID of this CICS region, and CICSHTH1 is the specific APPLID of the active CICS region.

The specific APPLID can be useful for naming those data sets that are unique; for example, dump data sets.

CICSSVC
245 is the CICS type 3 SVC number installed in the LPA, and defined to MVS in an SVCPARM statement. For more information, see "CICSSVC" on page 138.

For guidance information about installing the CICS SVC in the LPA, and defining it to MVS, see Installing the CICS SVCs in the Installation Guide.

DFLTUSER
CICSUSER is the default user ID specified to RACF. During startup, CICS tries to sign on the default user ID. If it cannot be signed on (for example, if not defined), CICS issues a message and stops CICS initialization. After the valid default user ID is signed on, its security attributes are used for all CICS terminal users who do not sign on with the CESN transaction. If the default user ID is defined to RACF with a CICS segment, the operator attributes in that segment are also used for users who do not sign on.

MXT The maximum number of user tasks is limited to 30 for this run. For information about the tasks that are included in the **MXT** parameter, see "MXT" on page 186.

INITPARM
Passes parameters to programs. In this example, the DBCTL suffix (01) of DFSPZPxx is passed to DFHDBCON, and CICS is told to connect to the DB2 subsystem MYDB. You cannot use the ID of a data sharing group of DB2 subsystems on the **INITPARM** system initialization parameter; you must specify the ID of a single DB2 subsystem. If you want to use the **INITPARM** system initialization parameter to specify a DB2 subsystem, leave blank both the DB2GROUPID and the DB2ID in the installed DB2CONN definition. An ID specified in either of these attributes of the DB2CONN definition overrides an ID specified on the **INITPARM** system initialization parameter.

ISC Include the intersystem communication program, DFHISP, in order to use interregion communication (IRC).

IRCSTRT
This CICS is running with MRO, and interregion communication is started during initialization.

6. STEPLIB is the DDNAME of the library containing the modules loaded by the operating system. DFHSIP, which is loaded from STEPLIB, must receive control in an authorized state, so each partitioned data set (library) concatenated in STEPLIB must be individually APF-authorized. In this sample job stream, the CICS authorized library is CICSTS42.CICS.SDFHAUTH. CICSTS42.CICS.SDFJAUTH is also included, which is required for Java support, and must also be APF-authorized. If you do not require Java support, do not include this library.

   Placing user-written modules into an APF-authorized library might violate your security and integrity rules. The CICSTS42.CICS.SDFHAUTH library (and the CICSTS42.CICS.SDFJAUTH library, if used) must not be included in the MVS link list, so that you can protect the libraries and ensure that only approved users can run the DFHSIP module. When you define your STEPLIB DD statement, remember that all other libraries concatenated with the CICSTS42.CICS.SDFHAUTH library or the CICSTS42.CICS.SDFJAUTH library must also be APF-authorized; for example, IMS.RESLIB. APF-authorization is required because, if any of the libraries in a STEPLIB concatenation are not authorized, MVS regards all of them as unauthorized. If there is a non-authorized library in the STEPLIB concatenation, CICS fails to start, and issues message DFHKE0101 to indicate that the DFHSIP module is not in an APF-authorized library. For information about authorizing access to CICS data sets, see RACF data set profiles.

The pregenerated DFHSIP module, which has been link-edited with the authorized attribute (SETCODE AC(1)), is supplied in CICSTS42.CICS.SDFHAUTH.

You must put the Language Environment runtime libraries, CEE.SCEERUN and CEE.SCEERUN2, in the STEPLIB concatenation, or the MVS link list, to run COBOL, PL/I, C and C++, and Java programs that run in a JVM, under Language Environment. The order of the SCEERUN and SCEERUN2 libraries in relation to each other is important. SCEERUN2 must be in the concatenation before SCEERUN. Like SDFHAUTH, SCEERUN and SCEERUN2 must be an APF-authorized library.

The CICS DB2 attachment facility must load the DB2 program request handler, DSNAPRH. You can either place the DB2 library DSNxxx.SDSNLOAD library in the MVS link list or add it to the STEPLIB concatenation of the CICS job.

7. DFHRPL is the DD name of the library that contains modules loaded by CICS. Protect individually the partitioned data sets constituting this library to prevent unapproved or accidental modification of their contents. The DFHRPL concatenation must include the library containing your CICS application programs, shown in this example as `your.prog.library`, and your CICS control tables, shown in this example as `your.table.library`.

   In this sample job stream, the supplied library is CICSTS42.CICS.SDFHLOAD, which must be included in the CICS DFHRPL library concatenation. The CICSTS42.CICS.SDFHLOAD library contains only programs that run in problem state and must not be authorized.

   Language Environment runtime library requirements

   Use the services of Language Environment, which provides a common runtime environment for IBM implementations of assembler and those high-level languages (HLLs) supported by CICS, namely COBOL, PL/I, C, and C++.

   To use the Language Environment runtime libraries to support all your program languages, add the Language Environment runtime libraries SCEERUN2 and SCEERUN to the DFHRPL DD concatenation. SCEERUN2 must be before SCEERUN in the concatenation. If you are running COBOL programs, also add Language Environment runtime library SCEECICS to DFHRPL. The SCEECICS library must be concatenated before the SCEERUN library. Remove any libraries that contain runtime routines from earlier versions of COBOL, PL/I, and C/C++ from the DFHRPL DD concatenation.

   Debug Tool library

   If you are using Debug Tool to debug CICS applications, include the Debug Tool library SEQAMOD in DFHRPL. For information about using Debug Tool with CICS, see Using Debug Tool with CICS applications in CICS Application Programming.

   7a **DB2 requirements**

Generally, you do not have to include any DB2 libraries in the DFHRPL DD statement. If you do require DB2 libraries in the DFHRPL concatenation for an application, they must be placed after the CICS libraries; for example, add SDSNLOAD in the DFHRPL to support those applications that issue dynamic calls to the DB2 message handling module, DSNTIAR, or the later DSNTIA1, both of which are shipped in SDSNLOAD. DSNTIA1 is loaded by applications programs that include the DB2 application stub DSNTIAC, which issues an **EXEC CICS LOAD** command for program DSNTIAC.

8. Define this data set if you want to save data to use later. The temporary storage queues used, identified by symbolic names, exist until explicitly deleted. Even after the originating task is deleted, temporary data can be accessed by other tasks, through references to the symbolic name under which it is stored.

   For details of how to define these data sets, and for information about space calculations, see Chapter 2, “Setting up temporary storage data sets,” on page 13.

   If you are using temporary storage data sharing, ensure that you start the temporary storage server before it is required by the CICS regions.

   For more information about the temporary storage server and temporary storage data sharing, see Chapter 21, “Setting up and running a temporary storage server,” on page 327
9. The transient data intrapartition data set is used for queuing messages and data in the CICS region. For information about how to define these data sets, and about space calculations, see “Defining the intrapartition data set” on page 17.
10. Define one or both of these sequential data sets, if you want to use auxiliary trace. If you define automatic switching for your auxiliary trace data sets, define both data sets. If you define only one data set, its DD name must be DFHAUXT.

    For details of how to define these data sets, see Chapter 7, “Setting up auxiliary trace data sets,” on page 71.

    The auxiliary trace data sets in this job stream are unique to the active CICS region, and as such are identified in our example by using the specific APPLID of the active CICS region (CICSHTH1) as a second-level qualifier.

    If you allocate and catalog the auxiliary trace data sets on disk as shown in Figure 13 on page 73, you can define them to CICS in the startup job stream using the following DD statements:

    ```
    //DFHAUXT  DD  DSN=CICSTS42.CICS.applid.DFHAUXT,DCB=BUFNO=n,DISP=SHR
    //DFHBUXT  DD  DSN=CICSTS42.CICS.applid.DFHBUXT,DCB=BUFNO=n,DISP=SHR
    ```

    If you specify BUFNO greater than 1, you can reduce I/O involved in writing auxiliary trace records. A value in the range 4 - 10 can greatly reduce I/O when running with auxiliary trace on.
11. LOGA and CSSL are examples of extrapartition transient data queues.
    - LOGA defines a user data set used by the CICS sample programs.
    - CSSL defines the data set used by a number of CICS services.
    - CCSO is used as an output queue only when you are running C/370™ application programs.
    - CESO is used as an error queue only when you are running application programs under Language Environment.

      Sample definitions of the queues used by CICS are supplied in group DFHDCTG. DFHDCTG is unlocked, so you can alter the definitions before installation.

12. The CICS local catalog is used by the CICS domains to save some of their information between CICS runs, and to preserve this information across a cold start. The local catalog is not shared by any other CICS system. For details of how to create and initialize a CICS local catalog, see Chapter 6, “Setting up the catalog data sets,” on page 59.
13. There is only one global catalog.

    For details of how to create and initialize a CICS global catalog, see Chapter 6, “Setting up the catalog data sets,” on page 59.

    This sample job illustrates the use of the `AMP` parameter on the DD statement. Specifying this parameter, with its buffer subparameters, can help to improve restart and shutdown time. This example uses DEFINE CLUSTER statements that are shown in Figure 10 on page 61 and the associated notes given under 4 in “Defining the global catalog” on page 59. The values given are the minimum values suitable for these parameters and must not be reduced.
14. This transient data destination is used by CICS as the target for messages sent to any transient data destination before CICS has completed intrapartition transient data initialization.
15. CICS records transaction dumps on a sequential data set or a pair of sequential data sets, tape, or disk. The data sets must be defined with the DD names DFHDMPA and DFHDMPB, but if you define only one data set, its DD name must be DFHDMPA. CICS always attempts to open at least one transaction dump data set during initialization.

    For details about how to define CICS transaction dump data sets and how they are used, see Chapter 8, “Defining dump data sets,” on page 75.

    The transaction dump data sets in this job stream are unique to the active CICS region, and as such are identified by using the specific APPLID of the active CICS region (DBDCCIC1) as a second-level qualifier.
16. Use a SYSABEND, SYSMDUMP, or SYSUDUMP DD statement to direct MVS to produce a dump.

    In the sample job stream, the SYSABEND DD statement directs a formatted dump to a printer, and the SYSMDUMP DD statement saves an unformatted dump to the SYS1.SYSMDP00 data set on disk.

    MVS produces the requested dump if either of the following is true:
    - CICS ends abnormally.
    - CICS starts to end abnormally, but system recovery procedures enable CICS to end normally.

    The dump DD statements for requesting dumps are as follows:

    SYSABEND DD statement
    Produces a dump of user and system areas; this dump contains all the areas dumped in a SYSUDUMP plus the local system queue area (LSQA), including subpools 229 and 230, and the I/O system (IOS) control blocks for the failing task. The dump is formatted, so that it can be printed directly.

    SYSMDUMP DD statement
    Produces a dump of the system areas and the program address space. The dump is unformatted and machine readable; to be used, it must be printed by the interactive problem control system (IPCS).

    Note: The SYSMDUMP DD statement must specify a magnetic tape unit or a direct-access device.

To write more than one SYSMDUMP dump in the same data set on tape:

- DSNAME=SYS1.SYSMDPxx where xx is 00 through FF. SYSMDPxx is a preallocated data set that you must initialize with an end-of-file (EOF) mark on the first record.
- DISP=SHR.

You can ask MVS to write additional dumps only if you offload any previous dump and write an EOF mark at the beginning of the SYS1.SYSMDPxx data set. Your MVS installation must install an exit routine for message IEA993. For information about this installation exit routine, see *z/OS MVS Installation Exits*.

SYSUDUMP DD statement
Produces a dump of user areas. The dump is formatted, so that it can be printed directly.

The dump contents are as described only when you use the IBM-supplied defaults for the dumps. The contents of these dumps can be set during MVS system initialization and can be changed for an individual dump in the ABEND macro instruction, in a CHNGDUMP command, and by a SLIP command. For details, see the *z/OS MVS Initialization and Tuning Guide*.

Dumps are optional; use a dump DD statement only when you want to produce a dump.

For information about how defining these MVS system dump data sets, and about printing dumps from them, see the *z/OS MVS JCL Reference*. For information about how to interpret dumps, see *z/OS MVS Diagnosis: Tools and Service Aids*.

16a Default stdout file for C-language system services used by CICS

| The SYSPRINT statement is opened as the `stdout` file by C-language system
| service routines that are used by CICS, such as system SSL and JVM servers.
| If it is omitted, multiple `sysout` files might be dynamically allocated by the
| operating system instead.

17. The system definition file (CSD) is required by CICS to hold some resource definitions.

    You might want to provide job control DD statements for the CSD. If you do, the CSD data set is allocated at the time of CICS job step initiation, and *remains allocated for the duration of the CICS job step*.

    You might prefer to use dynamic allocation of the CSD. For dynamic allocation, do not specify a DD statement for the CSD. Specify the data set name (DSNAME) and the data set disposition (DISP) either in a **SET FILE** command or in the System Initialization (as parameters CSDDSN and CSDDISP). CICS uses the DSNAME and DISP to allocate the file as part of OPEN processing.

    For information about creating and initializing the CSD, see Chapter 5, "Setting up the CICS system definition data set," on page 37.

18. DFHLRQ is a file-control-managed VSAM key-sequenced data set (KSDS), used by CICS business transaction services (BTS). The supplied FILE resource definition for DFHLRQ is in CSD group DFHCBTS, which is automatically included in DFHLIST group list when you initialize or upgrade your CSD. The FILE definition specifies that it is to be opened on first reference, which occurs at the end of CICS initialization when it is opened by BTS. CICS issues warning messages DFHFC0951 and DFHSH0109 if the data set is not found. Although CICS continues running without this data set, define the DFHLRQ

data set, even if you are not using BTS. For information about DFHLRQ, see BTS overview in Business Transaction Services.

19. DFHEJDIR is a VSAM key-sequenced data set (KSDS) that contains a request streams directory, which must be shared by all the regions, listeners and AORs, in a logical EJB server. Request streams are used in the distributed routing of method requests for enterprise beans and CORBA stateless objects.

    DFHEJOS is a VSAM key-sequenced data set (KSDS) that contains details of stateful session beans that have been passivated. It must be shared by all the AORs in the logical EJB server.

    For information about defining the EJB directory and object store, see Example JCL to define an EJB object store data set and Example JCL to define an EJB directory data set.

20. DFHCMACD is a VSAM key-sequenced data set (KSDS) that is used by the CMAC transaction to provide online descriptions of CICS messages and codes. Before its first use, it must be defined and loaded as a KSDS data set. Chapter 11, “Defining the CMAC messages data set,” on page 99 describes DFHCMACD in greater detail.

21. DFHDBFK is a VSAM key-sequenced data set (KSDS) that is used by the CDBM transaction to store Group commands. Before its first use, it must be defined as a KSDS data set. The DFHDBFK DD statement is required only if you intend to use the command storage functions of the CDBM transaction. Defining the CDBM GROUP command data set describes DFHDBFK in greater detail.

22. You might want to provide job control DD statements for those user files that are defined in the CSD (if you are using RDO) or in a file control table (for BDAM files only). If you do, the data sets are allocated at the time of CICS job step initiation, and *remain allocated for the duration of the CICS job step*. FILEA, the distributed library containing the data for the sample application programs, is included in this startup job stream as an example of direct allocation by job control statement.

    Alternatively, you might prefer to take advantage of the CICS dynamic allocation of files. For dynamic allocation, do not specify a DD statement for the CSD. CICS then uses the full data set name as specified in the **DSNAME** parameter of the FILE resource definition (up to 44 characters), together with the **DISP** parameter, to allocate the file as part of OPEN processing. This form of dynamic allocation applies equally to files that are defined to be opened explicitly, and those that are to be opened on first reference by an application. For more information about file opening, see Chapter 9, “Defining user files,” on page 81. For information about the attributes that you can define on FILE resources, see FILE resources in the Resource Definition Guide.

    The card reader/line printer (CRLP) simulated terminals shown in the sample job stream are defined in the sample TCT (not used in this startup job). See the copy member DFH$TCTS, in CICSTS42.CICS.SDFHSAMP, for the source statements that you need for such devices.

23. For sequential devices, the last entry in the input stream can be CESF GOODNIGHT\ to provide a logical close, and quiesce the device. However, if you close a device in this way, the receive-only status is recorded in the warm keypoint at CICS shutdown. So the terminal is still in RECEIVE status in a subsequent warm start, and CICS does not then read the input file.

    Note the end-of-data character (the “\” symbol) at the end of each line of the sample.

A sample CICS startup procedure

As an alternative to submitting a batch job to the MVS internal reader, you can use the MVS **START** command to start CICS as a started task. Using this method, your startup job stream must be coded according to the rules for coding procedures, and the procedure must be installed in an MVS procedure library.

About this task

If you intend to start CICS with the **START** command you must either:

- Give the MVS started task procedure a name different from the subsystem name in IEFSSNaa (default 'CICS'), or
- Issue the start command with the parameter SUB=JES2 or SUB=JES3 as appropriate.

You can use the following form of the MVS **START** command to start a job from the console:

```
S|START procname[.identifier][,SUB=subsystemname][,keyword=option
 [,keyword=option] . . .]
```

where:

procname
The name of the cataloged procedure that defines the job to be started.

identifier
The name you choose to identify the task.

SUB=subystemname
The name of the subsystem that is to select the job for processing. If you omit this parameter, the primary job entry subsystem is used.

keyword=option
Any appropriate keyword to override the corresponding parameter in the procedure. You can use this parameter to override symbolic parameters defined in the cataloged procedure.

For guidance information about the complete syntax of the START command, and all the keywords and options you can use, see *z/OS MVS System Commands*.

To start CICS, you only need to code **procname.identifier,keyword(s)=option**.

For example:

```
START DFHSTART.CICSA,SIP=T,REGNAME1=IDA,REGNAM2=IDA
```

In this example of the MVS **START** command:

- DFHSTART is the name of the CICS-supplied cataloged startup procedure.
- CICS is being started with a task ID of CICSA.
- SIP is the suffix of the DFH$SIPx member in the SYSIN data set, CICSTS42.CICS.SYSIN, to be used by this CICS region.
- REGNAM1 and REGNAM2 are qualifiers added to the CICS system data sets specified in the procedure (for example, CICSTS42.CICS.CICSHTH1.DFHTEMP) to identify uniquely the data sets for this CICS region. REGNAM1 is set to the same value as REGNAM2 for an MRO region.

For information about the DFHSTART procedure, see the CICS startup procedure, DFHSTART in the Installation Guide.

If you are running CICS with RACF, you must associate the cataloged procedure name with a suitably authorized RACF user through the RACF table, ICHRIN03. For information about this association, see the *CICS RACF Security Guide*.

Chapter 19. Preparing CICS for using debugging tools

Before application programmers can use certain debugging tools with CICS, you will need to perform some system definition tasks. This chapter describes those tasks.

It contains the following topics:
- "Preparing your CICS region for debugging"

Preparing your CICS region for debugging

Before application programmers can use certain debugging tools with CICS, you must configure your CICS region accordingly.

About this task

You can prepare your CICS region for debugging application programs using the following tools:
- Debug Tool, for compiled language application programs (programs written in COBOL, PL/I, C, C++), and for Language Environment-enabled Assembler subroutines).
- Remote debugging tools (for compiled language application programs, Language Environment-enabled Assembler Subroutines, and Java programs). Note that for compiled language programs, and Assembler subroutines, Debug Tool is used as the debugging server.

This topic does not apply to other debugging tools, such as the CICS Execution Diagnostic Facility (CEDF).

Since you will need to restart the region, it is advisable to plan which regions will be used for debugging applications.
- It is unlikely that application programs will be debugged in your production regions, especially if the applications are well established and known to be reliable; it is more likely that debugging will take place in regions which are used to develop and test new applications.

To prepare your CICS region for debugging:

Procedure

1. If you plan to use the region for debugging compiled language programs, include the Debug Tool library `SEQAMOD` in the `DFHRPL` concatenation in your CICS startup JCL. For more information, see "Using the sample startup job stream" on page 307.
2. Create the *debugging profile data sets*. For more information, see Chapter 14, "Setting up the debugging profiles data sets," on page 107.
3. Include the resource definition for the debugging profile file in a resource definition list that is named in the "GRPLIST" on page 169 system initialization parameter.
4. Optionally, specify the following value for the "DEBUGTOOL" on page 152 system initialization parameter:
   ```
   DEBUGTOOL=YES
   ```

If you do not specify `DEBUGTOOL=YES`, you can enable the region for debugging when it is running:

- To enable the region for debugging from a program, use the EXEC CICS SET SYSTEM DEBUGTOOL command
- To enable the region for debugging from the master terminal transaction, use the CEMT SET SYSTEM DEBUGTOOL command

Enabling the region for debugging when it is running is recommended for regions which are not normally used for debugging. When debugging is complete, you can disable the region for debugging, using the same commands.

5. Define and install Debug Tool's resource definitions. They are located in member `EQACCSD` in Debug Tool's `SEQASAMP` data set. For more information, see the *Debug Tool for z/OS and OS/390 User's Guide*.

Part 3. Initializing CICS data sharing servers

To initialize CICS data sharing servers, you must set up AXM system services and define the appropriate data sharing server.

CICS data sharing servers support:

- Temporary storage data sharing
- Coupling facility data tables
- Named counters

  Users implementing CICSPlex SM sysplex optimised workload management will require a region status server to be configured. This server is a bespoke type of CFDT server into which CICS regions broadcast generic system status data which is subsequently interrogated by CICSPLEX SM for making dynamic routing decisions. The table structure managed by this server may not be modified, adjusted, or reconfigured for user application utilization.
- Chapter 20, “Defining and starting AXM system services,” on page 325 describes how to define and start AXM system services
- Chapter 21, “Setting up and running a temporary storage server,” on page 327 describes how to set up and run a CICS temporary storage data sharing server
- Chapter 22, “Setting up and running a coupling facility data table server,” on page 345 describes how to set up and run a CICS coupling facility data table server
- Chapter 25, “Coupling facility server operations,” on page 403 gives an overview of the operations which are common to all three CICS coupling facility servers.
- Chapter 24, “Setting up and running a named counter server,” on page 385 describes how to set up and run a CICS named counter server.

Chapter 20. Defining and starting AXM system services

The authorized cross-memory (AXM) server environment provides the runtime environment for CICS data sharing server regions. You must define and start AXM system services to run any of the CICS data sharing servers.

About this task

To establish AXM cross-memory connections for an MVS image, you must define an MVS subsystem called AXM. You can choose to create the subsystem statically or dynamically.

Procedure

- To define the MVS subsystem statically, add an entry with the required parameters to the IEFSSN*xx* member of SYS1.PARMLIB:

  ```
  SUBSYS SUBNAME(AXM) INITRTN(AXMSI)
  ```

  Defining AXM in the IEFSSN*xx* member ensures that AXM system services automatically become available when you IPL MVS.

  The AXM subsystem initialization routine, AXMSI, sets up the appropriate definitions from the master scheduler region. Note that AXM uses the subsystem definition only as a means of scheduling AXM initialization in the master scheduler address space. The MVS subsystem interface for AXM is not activated or used.
- To define the MVS subsystem dynamically, enter the following command:

  ```
  SETSSI ADD,SUBNAME=AXM,INITRTN=AXMSI
  ```

  If initialization of the AXM subsystem fails for any reason, for example, because of an error in the command or because AXMSI is not in a linklist library, MVS does not allow another attempt because the subsystem is then already defined. In this case, use a different subsystem name, such as AXM1, because AXM does not rely on a specific subsystem name. If you start AXM successfully the first time, further attempts are ignored.

What to do next

When the AXM subsystem has started successfully, you can create a data sharing server.

Chapter 21. Setting up and running a temporary storage server

CICS transactions running in an AOR access temporary storage (TS) pools through a temporary storage server that supports a named pool. In each MVS image in the sysplex, you must set up one temporary storage server for each pool that is defined in the coupling facility.

Procedure

1. Define a TS pool as a temporary storage list structure in a coupling facility.
2. Define and start up the temporary storage job, for a shared TS pool to run in an mvs batch region.
3. When the temporary storage region is running, you can issue commands to control the queue server for the pool.
4. Optionally, you can upload and reload queue pools.

Overview of the temporary storage data sharing server

CICS transactions running in an AOR access TS pools through a temporary storage data sharing server that supports a named pool.

In each z/OS image in the sysplex, you need one TS server for each pool defined in a coupling facility which can be accessed from that z/OS image. All TS pool access is performed by cross-memory calls to the TS server for the named pool.

An AOR can access more than one TS server concurrently. This multiserver access is required if you create multiple pools, because each TS server provides access to only one pool of TS queues.

CICS maps temporary storage requests to a TS server using the POOLNAME attribute of a TSMODEL resource definition.

Figure 28 on page 328 illustrates a parallel sysplex with three CICS AORs linked to the temporary storage server address space(s).

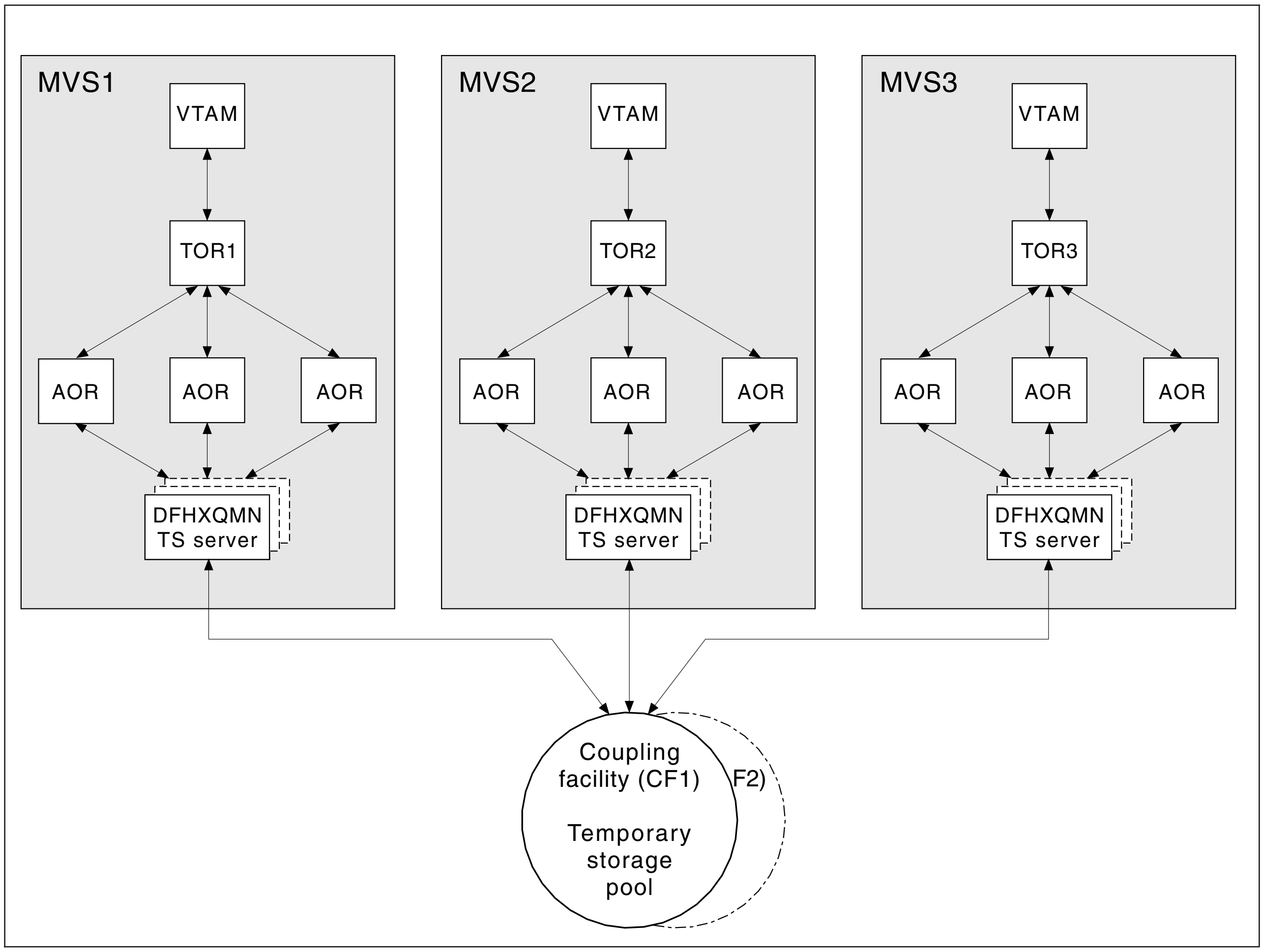


Figure 28. Conceptual view of a Parallel Sysplex with TS data sharing.

Security

The server must be authorized to access the coupling facility list structure in which the temporary storage pool is defined; XES checks this. The server must also be authorized to act as a temporary storage server; AXM checks this. For information on how to define the necessary authorizations see the *CICS RACF Security Guide*.

Defining temporary storage pools for temporary storage data sharing

You define a temporary storage (TS) pool as a temporary storage list structure in a coupling facility by using coupling facility resource manager (CFRM) policy statements.

About this task

To use TS data sharing, main or auxiliary storage for your TS queues is replaced by one or more TS pools, where the scope and function of each TS pool is similar to a queue-owning region (QOR).

Each TS pool is defined, using MVS cross-system extended services (XES), as a keyed list structure in a coupling facility. Therefore you must define the pool using the coupling facility resource manager (CFRM) policy statements. You use the CFRM policy definition utility, IXCMIAPU, to specify the size of the list structures required, and their placement in a coupling facility. For an example of this utility, see member IXCCFRMP in the SYS1.SAMPLIB library (see the information about the administrative data utility for CFRM policy data in *z/OS MVS Setting Up a Sysplex*). An example of a definition statement is shown in Figure 29.

```
|   STRUCTURE  NAME(DFHXQLS_PRODTSQ1)
|     SIZE(8192)
|     INITSIZE(10240)
|     PREFLIST(FACIL01,FACIL02)
```

Figure 29. Example of defining the estimated size of a list structure

The name of the list structure for a TS data sharing pool is created by appending the TS pool name to the prefix DFHXQLS_, giving DFHXQLS_*poolname*. When defined, you must activate the CFRM policy using the MVS operator command `SETXCF START`.

When a list structure is allocated, an initial size and a maximum size can be
| specified in the CFRM policy. All structure sizes are rounded up to the next
| storage increment for the coupling facility level (CFLEVEL) at allocation time. For
| example, sizes are rounded up to the nearest 1 MB for CFLEVEL 16. Provided that space is available in the coupling facility, a list structure can be dynamically expanded from its initial size towards its maximum size, or contracted to free up coupling facility space for other purposes. If the initial structure allocation becomes full, the structure does not expand automatically, even if the structure allocated is less than the specified maximum size. To expand a list structure when the allocation becomes full, you can expand it (up to its maximum size) using the following SETXCF command:

```
SETXCF START,ALTER,STRNAME=DFHXQLS_poolname,SIZE=nnnn
```

Defining the CFRM policy statements for a list structure does not create the list structure. A TS server creates the list structure during its initialization. See Chapter 21, “Setting up and running a temporary storage server,” on page 327.

If the server connection fails, there are implications for coupling facilities. See “Server connection management” on page 407 and Named counter recovery.

For further information about defining list structures, see the following z/OS information:
- *z/OS MVS Setting Up a Sysplex*
- *z/OS MVS Programming: Sysplex Services Guide*
- *z/OS MVS Programming: Sysplex Services Reference*

Storage calculations for temporary storage data sharing

You can use the System z® Coupling Facility Structure Sizer tool (CFSizer) to calculate storage requirements for temporary storage list structures in a coupling facility.

A coupling facility structure contains both stored data and the information needed to manage and access that data, in a similar way to a key-sequenced data set. The data for each entry in the coupling facility is stored as a chain of fixed-size (usually 256-byte) elements, which means that the exact length for variable-length data must be stored separately. To do this, CICS includes a length prefix in the stored data, so space calculations must allow for each entry using a whole number of elements. The amount of internal control information depends on the level of functionality and performance of the coupling facility control code for the current coupling facility level (CFLEVEL). The storage requirements can increase for a higher CFLEVEL. For more information, see "Coupling facility storage management" on page 404.

CFSizer is a web-based application that takes these factors into account and communicates with a coupling facility at a current CFLEVEL to calculate storage requirements. See CFSizer.

To use CFSizer to calculate storage requirements for temporary storage list structures, enter the following information:

Maximum number of queues
: The maximum number of data lists that are reserved when CICS allocates the structure list. This value determines the maximum number of large queues that can be stored in the structure and corresponds to the **MAXQUEUES** server parameter. See "List structure parameters" on page 334.

  A large queue is one where the total size of the data items exceeds 32K. For a small queue with multiple items that does not exceed 32K, all the queue items are stored as the data portion of the queue index entry. If the queue exceeds 32K, it is converted to a form where one item per entry is stored in a separate list in the structure and is referred to by the queue index entry.

  Specify a large enough number to handle large queues, but not so large that unused preallocated list headers use a large amount of coupling facility storage. The valid range is from 1 to 999999. The default is 1000.

Average rounded item size
: The average amount of storage required for each TS queue item. Each item has a two-byte length prefix and is stored as one or more 256-byte elements. This value determines the entry to element ratio that is used to calculate the required structure size. The valid range is from 1 to 32768. The default is 256.

  If all queue items are approximately the same size, calculate this value by taking the average data size, adding two, and rounding up to the next multiple of 256. The amount of element storage required is two bytes more than the data item size because of the length prefix on each item.

  If queue items are different sizes, round up each size first before you take the average. For example, if half the items are 100 bytes and half are 300 bytes, round up the sizes to 256 and 512 respectively, then average them. The resulting average rounded item size is 384, which is more accurate than using the average item size of 200 and then rounding it up to 256.

Total number of items in all queues
: The total number of entries in all the TS queues.

Target usage percent
: The percentage of the structure space that the given total number of items are expected to use. Specify a number in the range of 1 to 100. The default is 75. This value ensures the following:

  - Free space exists for temporary expansion.
  - If the initial free space is not enough, there is time to expand the structure in response to warning messages (which normally start at 80%).
  - Activity to alter entry to element ratios is reduced.

Maximum expansion percent

The percentage that the structure can expand. If a non-zero value is specified, the maximum structure size will be greater than the initial structure size by an amount such that the total amount of data can increase by this percentage. For example, if the value 200 is specified, the initial size is enough to store the specified total number of items, and the maximum size is enough to store three times that number of items.

Defining TS server regions

A shared TS pool consists of an XES list structure, which is accessed through a cross-memory queue server region. You start a shared TS pool in an MVS image by starting up a queue server region for that pool.

About this task

To start up the TS server region for a shared TS pool, you can use either a batch job or a started task. The job or task must invoke the queue server region program, DFHXQMN, which is in an APF-authorized library.

Procedure

1. Specify the DFHXQMN program either in a SYSIN data set defined in the JCL, or in the **PARM** parameter on the EXEC statement.
2. Specify the mandatory and optional startup parameters for the DFHXQMN program.
   a. You must specify a SYSPRINT DD statement for the print file.
   b. You must specify a SYSIN DD statement for the server parameters.
   c. You must specify the TS pool name.
   d. It is recommended that you specify TIME=NOLIMIT. The server task remains in a wait during most normal processing, because server processing is performed under the TCB of the client CICS region. If you omit this parameter, your server job could fail with abend S522 (wait limit exceeded), depending on the JWT value specified in the SMFPRM*xx* member of SYS1.PARMLIB.
   e. Specify additional parameters as required. For example, you might want to control the maximum number of queues that are to be supported in the pool and the number of buffers the server is to allocate.

Sample startup job for a TS server

Figure 30 shows an example of the JCL you might use to start a TS server.

```
//PRODTSQ1 JOB  ...
//TSSERVER EXEC PGM=DFHXQMN,REGION=64M,TIME=NOLIMIT Start TS data sharing server
//STEPLIB  DD   DSN=CICSxxx.SDFHAUTH,DISP=SHR       Authorized library
//SYSPRINT DD   SYSOUT=*        Messages and statistics
//SYSIN    DD   *
POOLNAME=PRODTSQ1               Pool name
MAXQUEUES=5000                  Allow up to 5000 large queues
BUFFERS=1000                    1000 buffers (32K each, 32M total)
/*
```

Figure 30. Sample startup job for a TS queue server

Queue server REGION parameter

The queue server REGION parameter JCL needs to specify at least enough virtual storage for the specified number of buffers plus the storage used to process queue requests.

Each buffer occupies a little more than 32K bytes, and each connected CICS region can have up to ten queue requests active at a time, each using 5K to 10K bytes, so to be safe the REGION size should allow at least 32K per buffer and 100K for each connected CICS region, plus a margin of about 10% for other storage areas.

During server initialization, the server acquires all of the available storage above the 16M line, as determined by the REGION size, then releases 5% of it for use by operating system services. It also acquires 5% of the free storage below the line for use in routines which require 24-bit addressable storage, for example sequential file read and write routines.

After server initialization, AXM page allocation services are used to manage server region storage. Server statistics indicate how much storage is allocated and used within the storage areas above and below the 16M line, which are called AXMPGANY and AXMPGLOW in the statistics.

If a task in the server region or a cross-memory request runs out of storage, this is likely to result in AXM terminating that task or request using a simulated abend with system completion code 80A to indicate a GETMAIN failure. Although the server can usually continue processing other requests in this case, running out of storage in a critical routine can cause the server to terminate, so it is best to ensure that the REGION size is large enough to eliminate the risk.

TS queue server parameters

Parameters are specified in the form KEYWORD=value. You can optionally specify keywords in mixed case to improve readability.

If you specify more than one parameter in the PARM field, or on the same SYSIN input line, the parameters must be separated by commas. Any text following one or more spaces is taken as a descriptive comment. Any parameter line starting with an asterisk or a space is assumed to be a whole line comment.

You can enter some parameter keywords in more than one form, such as an abbreviation. The standard form of each keyword is generally the longest form of the first word shown.

The main parameters used are listed on the server print file during start-up.

The following parameters are all valid as initialization parameters (in the SYSIN file, or the PARM field), and some can be modified by the server SET command.

You can display any parameter with the server DISPLAY command. Display the values of all parameters using DISPLAY ALLPARMS.

Specify the following keywords to give combined lists of information:
- PARMS for main parameter values
- STATS for all available statistics
- INIT to select parameters and statistics whose values are usually displayed when initialization is complete

Primary parameters

These parameters are usually specified for all servers:

POOLNAME=*pool_name*
: specifies the name, of 1 to 8 characters, of the queue pool used to form the server name and the name of the coupling facility list structure DFHXQLS_poolname. This parameter is valid only at initialization, and must always be specified.

  This keyword can also be coded as **POOL**.

BUFFERS={100|number}
: specifies the number of queue buffers to allocate for the server address space.

  A queue index buffer holds a queue index entry plus up to 32K of queue data (for a small queue). When a READ or WRITE request completes the queue index information is retained in the buffer. This can avoid the need to reread the queue index if the same queue is referenced from the same MVS image before the buffer has been reused. If no buffer is available at the time of a request, the request is made to wait until one becomes free.

  The number of buffers should preferably be at least ten for each CICS region that can connect to the server in this MVS image. This avoids the risk of buffer waits. Additional buffers may be used to reduce the number of coupling facility accesses by keeping recently used queue index entries in storage. In particular, if the current version of a queue index entry is in storage at the time a queue item is read, the request requires only one coupling facility access instead of two. If the current version of a queue index entry is in storage when a second or subsequent item is written to the same queue, the request requires only one coupling facility access instead of three.

  It is not worth defining extra buffers beyond the point where this might cause MVS paging, as it is more efficient to reread the index entry than to page in the buffer from auxiliary storage. This parameter is valid only at initialization.

  The valid range is from 1 to 999999.

  This keyword can also be coded as **BUF**.

FUNCTION={SERVER|UNLOAD|RELOAD}
: Information about this parameter is given in "Unloading and reloading queue pools" on page 341.

STATSOPTIONS={NONE|SMF|PRINT|BOTH}
: specifies the statistics options that determine whether interval statistics are produced and whether statistics are sent to SMF, the print file, or both.

  This keyword can also be coded as **STATSOPT**.

ENDOFDAY={00:00|hhmm}
: specifies the time when end of day statistics are to be collected and reset. If statistics options specify NONE, end of day statistics are written to the print file. The valid range is from 00:00 to 24:00.

  This keyword can also be coded as **EOD**.

STATSINTERVAL={3:00|hhmm}
: specifies the statistics interval, within the range of 1 minute to 24 hours. It is ignored if STATSOPTIONS=NONE.

  The valid range is from 00:01 to 24:00 (although it may be specified in seconds).

  This keyword can also be coded as **STATSINT**.

Automatic restart manager (ARM) parameters

During server initialization, the server unconditionally registers with ARM except when the server program is invoked with either the UNLOAD or the RELOAD functions. The server will not start if the registration fails.

Use the following parameters to override default processing for the automatic restart manager:

ARMELEMENTNAME=*elementname*

specifies the automatic restart manager element name, up to 16 characters, to identify the server to ARM for automatic restart purposes. The permitted characters for the element name are A to Z 0-9 $ # @ and the underscore symbol (_).

The default identifier is of the form DFHXQ*nn_poolname*, where XQ represents the server type, *nn* is the &SYSCLONE value for the system (which can be either one or two characters), and *poolname* is the name of the pool served by the server.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMENT** or **ARMELEMNAME**.

ARMELEMENTTYPE=*elementtype*

specifies the automatic restart manager element type, up to 8 characters for use in ARM policies as a means of classifying similar elements. The permitted characters for the element type are A to Z 0-9 $ # and @.

The default element type is SYSCICSS.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMTYPE**.

List structure parameters

The list structure parameters specify the attributes that are used only for initial allocation of the temporary storage list structure for a TS pool. Initial allocation occurs the first time a server is started for the TS pool.

The list structure parameters are as follows:

MAXQUEUES={1000|*number***}**

Specifies the maximum number of data lists to be reserved when the structure is allocated, which determines the maximum number of large queues that can be stored in the structure. This parameter also determines how many list headers are defined when the structure is created.

Specify a large enough number to handle large queues, but not so large that unused preallocated list headers use a large amount of coupling facility storage.

You cannot change this number without reallocating the structure. Therefore, if the structure is being allocated at less than its maximum size, the value here should be based on the maximum possible size of the structure rather than its initial size.

| This parameter corresponds to the “Maximum number of queues” value in the
| CFSizer tool (see “Storage calculations for temporary storage data sharing” on
| page 329.

The valid range is from 1 to 999999.

This keyword can also be coded as **MAXQ**.

POOLSIZE={0|*number*{K|M|G}}
Specifies the maximum amount of storage to be allocated for the list structure, expressed as kilobytes (*n*K), megabytes (*n*M), or gigabytes (*n*G).

This parameter is used when the list structure is created with a specified value of less than that specified for the list structure in the coupling facility resource management (CRFM) policy.

The default value 0 specifies that no maximum limit is applied here and the maximum that is specified in the CFRM policy applies.

A non-zero value is rounded up by MVS to the next storage increment for the coupling facility level (CFLEVEL). For example, the value is rounded up to the nearest 1 MB for CFLEVEL 16.

The valid range is from 0 to 16777215M. However, you must specify a value that is less than the maximum size of a structure in z/OS, otherwise a z/OS error occurs. For example, in z/OS, Version 1 Release 12, the maximum size of a structure is 1048576 MB (1 TB). For more details, see the information about CFRM parameters in *z/OS MVS Setting Up a Sysplex*.

For information about defining temporary storage list structures, see "Defining temporary storage pools for temporary storage data sharing" on page 328.

Debug trace parameters

These parameters are used only for intensive debug tracing.

Note that using these options in a production environment may significantly impact performance and cause the print file to grow very rapidly, using up spool space.

Trace messages from cross-memory requests may be lost if they are generated faster than the trace print subtask can print them. In such cases, the trace indicates only how many messages were lost.

TRACECF={OFF|ON}
specifies the coupling facility interface debug trace options, OFF or ON. This option produces trace messages on the print file indicating the main parameters to the coupling facility request interface and the result from the IXLLIST macro.

This keyword can also be coded as **CFTR** or **CFTRACE**.

TRACERQ={OFF|ON}
specifies the queue request debug trace options, OFF or ON. This option produces trace messages on the print file indicating the main parameters on entry to the shared queue request or shared queue inquire interface and the results on exit.

This keyword can also be coded as **RQTR** or **RQTRACE**.

Tuning parameters

These parameters are provided for tuning purposes, but usually you can omit these and let the TS server use the default values.

ELEMENTRATIO={1|*number*}
An MVS coupling facility resource management (CFRM) parameter that specifies the element part of the entry-to-element ratio when the structure is first allocated. This value determines the proportion of the structure space that is initially set aside for data elements.

The ideal value for the entry-to-element ratio is the average size of data for each entry divided by the element size. However, the server automatically adjusts the ratio according to the actual entry and element usage.

This parameter is valid only at server initialization, and is used only when the structure is first allocated. The valid range is from 1 to 255.

You can abbreviate this keyword to **ELEMRATIO**.

For further information about this parameter in the coupling facility, see *z/OS MVS Programming: Sysplex Services Guide*.

ELEMENTSIZE={256|*number*}
An MVS CFRM parameter that specifies the element size for structure space, which must be a power of 2. This parameter is used only for coupling facility log streams. The valid range is 256 to 4096. For current coupling facility implementations, there is no reason to change this parameter from the default value of 256.

This parameter is valid only at server initialization and is used only when the structure is first allocated.

You can abbreviate this keyword to **ELEMSIZE**.

ENTRYRATIO={1|*number*}
An MVS CFRM parameter that specifies the entry part of the entry-to-element ratio when the structure is first allocated. This value determines the proportion of structure space that is initially set aside for list entry controls.

It is not essential to specify this parameter because the server automatically adjusts the ratio, based on actual usage, to improve space utilization if necessary.

This parameter is valid only at server initialization and is used only when the structure is first allocated. The valid range is from 1 to 255.

For further information about this parameter in the coupling facility, see *z/OS MVS Programming: Sysplex Services Guide*.

LASTUSEDINTERVAL={00:10|*hh*:*mm*}
A CICS parameter that specifies how often the last used time for large queues is updated.

For small queues, the last used time is updated on every reference. For large queues, updating the last used time requires an extra coupling facility access, so this update occurs only if the queue has not previously been accessed in this interval of the current time. Therefore, the last used time interval returned by an **INQUIRE** command can be greater than the true value by an amount up to the value of this parameter. The last used time is used mainly to determine whether the queue is obsolete, so a suitable value for the **LASTUSEDINTERVAL** parameter is normally a few minutes.

See INQUIRE TSQUEUE / TSQNAME.

The valid range is from 00:00 to 24:00. This value can also be specified in seconds.

You can abbreviate this keyword to **LASTUSEDINT**.

SMALLQUEUEITEMS={9999|*number*}
A CICS parameter that specifies the maximum number of items that can be stored in the small queue format in the queue index entry data area. This parameter can force a queue to be converted to the large queue format if it has

a large number of small items. It can be more efficient to write the items separately than to rewrite the whole small queue data area each time.

The valid range is from 1 to 32767.

SMALLQUEUESIZE={32K|*number*}
A CICS parameter that specifies the maximum data size for a small queue, including the two-byte length prefix on each data item. If a queue exceeds the maximum size when a second or subsequent item is written to it, the queue is converted to the large queue format.

This parameter can force queues to be converted to the large queue format at a smaller size than 32K. This is to prevent large amounts of data being written to the small queue format. On systems where asynchronous coupling facility processing causes contention for hardware resources, using this parameter can improve performance. However, on most systems, it is more efficient to defer conversion until the maximum size of 32K is reached.

The valid range is from 4096 to 32768.

Warning parameters

These parameters modify the threshold at which warning messages and automatic ALTER actions occur when the structure becomes nearly full:

ELEMENTWARN={80|number}
specifies the percentage of elements in use at which warnings and automatic ALTER actions should be first triggered.

The valid range is from 1 to 100.

This keyword can also be coded as **ELEMWARN**.

ELEMENTWARNINC={5|number}
specifies the percentage increase (or decrease) of elements in use before the next warning should be triggered (reduced to 1 when next increase would otherwise reach 100). Additional messages are issued as the number of elements in use changes. The messages stop when the number of elements in use falls at least by this percentage below the initial warning level.

The valid range is from 1 to 100.

This keyword can also be coded as **ELEMWARNINC**.

ENTRYWARN={80|number}
specifies the percentage of entries in use at which warnings and automatic ALTER actions should be first triggered.

The valid range is from 1 to 100.

ENTRYWARNINC={5|number}
specifies the percentage increase (or decrease) of entries in use before next warning should be triggered (reduced to 1 when next increase would otherwise reach 100). Additional messages are issued as the number of elements change. The messages stop when the number of entries in use falls at by least the specified percentage below the initial warning level.

The valid range is from 1 to 100.

Automatic ALTER parameters

Define the following parameters to modify the conditions under which the server attempts an automatic ALTER action when the structure becomes nearly full.

For details of the queue server automatic ALTER process, see “Queue server automatic ALTER processing.”

ALTERELEMMIN={100|number}
specifies the minimum number of excess elements that must be present for an automatic ALTER to be issued to convert those elements to entries.

The valid range is from 1 to 999999999.

ALTERELEMPC={1|number}
specifies the minimum percentage of excess elements that must be present for an automatic ALTER to be issued to increase the proportion of entries.

The valid range is from 0 to 100.

ALTERENTRYMIN={100|number}
specifies the minimum number of excess entries that must be present for an automatic ALTER to be issued to convert those entries to elements.

The valid range is from 0 to 999999999.

ALTERENTRYPC={1|number}
specifies the minimum percentage of excess entries which must be present for an automatic ALTER to be issued to increase the proportion of elements.

The valid range is from 0 to 100.

ALTERMININTERVAL={00:10|hhmm}
specifies the minimum time interval to be left between automatic ALTER attempts when the structure is nearly full (above the element or entry warning level).

The valid range is from 00:00 to 24:00.

This keyword can also be coded as **ALTERMININT**.

Queue server automatic ALTER processing

The queue server monitors the total number of elements and entries in use in the structure, using information returned by the coupling facility on every request.

When the numbers in use exceed the specified thresholds, a warning message, DFHXQ0411 or DFHXQ0412, is issued, and is repeated each time the number in use increases beyond further thresholds.

Each time the warning is issued, the server tests whether an automatic ALTER for the entry to element ratio should be performed. The test is done by calculating how many excess elements or entries will be left when the other runs out completely. This is based on the ratio between the current numbers of elements and entries in use.

An IXLALTER request is issued to alter the entry to element ratio to the actual current ratio between the number of entries and elements in use if:

- The number of excess elements or entries exceeds the number specified in the ALTERELEMMIN or ALTERENTRYMIN parameter, and
- The same number expressed as a percentage of the total exceeds the value specified in the ALTERELEMPC or ALTERENTRYPC parameter

Only one ALTER request may be active at a time for a given structure. If the ALTER process is started by one server, the ALTER of another server will be rejected. However, the system automatically notifies all servers when the ALTER completes, giving the new numbers of elements and entries so that each server can update its own status information.

A further ALTER attempt is suppressed until at least the minimum ALTER interval (specified by the ALTERMININTERVAL parameter) has elapsed, if:

- Any form of ALTER has already been used recently (by any server or by an operator SETXCF ALTER command), and
- The structure space usage has remained above warning levels since the previous attempt.

Shared TS queue server commands

Commands can be issued to control a queue server using the MVS MODIFY (F) command specifying the job or started task name of the server region.

The general form of a queue server command is as follows:

```
F server,cmd parameter,parameter...   comments
```

The MVS STOP command is equivalent to issuing the server command STOP using the MVS MODIFY command.

The queue server supports the following commands:

SET keyword=value
changes one or more server parameter values. This applies to all parameters other than those indicated as being for initialization only. The command can be abbreviated to T, as for the MVS SET command.

DISPLAY keyword
displays one or more parameter values, or statistics summary information, on the console. The valid parameter keywords for DISPLAY and PRINT are described later in this section. The command can be abbreviated to D, as for the MVS DISPLAY command.

PRINT keyword
produces the same output as DISPLAY but only on the print file.

STOP
terminates the server, waiting for any active connections to terminate first, and preventing any new connections.

The command can be abbreviated to P, as for the MVS STOP command.

CANCEL {RESTART={NO|YES}}
Terminate the server immediately. You can specify whether automatic restart should be requested.

For information about CANCEL RESTART see "The CANCEL command options" on page 341.

The server also responds to XES events such as an operator SETXCF command to alter the structure size. If the server can no longer access the coupling facility, it automatically issues a server CANCEL command to close itself down immediately.

DISPLAY and PRINT keywords

DISPLAY or PRINT can display the values of any system initialization parameters.

These keywords can also display the following additional information:

ARMREGISTERED
Shows whether ARM registration was successful (YES or NO).

CONNECTIONS
List of the job names and APPLIDs for the regions currently connected to this server. You can also code this keyword as **CONN**.

Statistics summaries

BUFSTATS
Queue index buffer pool statistics.

You can also code this keyword as **BUFST**.

CFSTATS
Coupling facility interface I/O and response statistics.

You can also code this keyword as **CFST** or **STATSCF**.

POOLSTATS
Usage statistics for the pool list structure as a whole.

You can also code this keyword as **POOLST**.

STORAGESTATS
Main storage allocation statistics for the server address space.

You can also code this keyword as **STGST**, **STGSTATS**, or **STORAGEST**.

Keywords representing combined lists of information

PARAMETERS
Main parameter values.

You can also code this keyword as **PARM**, **PARMS**, or **PARAM**.

ALLPARAMETERS
All parameter values.

You can also code this keyword as **ALLPARMS**.

STATISTICS
All available statistics.

You can also code this keyword as **STAT** or **STATS**.

INITIALIZED
Selected parameters and statistics whose values are usually displayed when initialization is complete.

You can also code this keyword as **INIT**.

ARM
Display all ARM-related parameter values:

- ARMELEMENTNAME
- ARMELEMENTTYPE
- ARMREGISTERED

You can also code this keyword as **ARMSTATUS**.

The CANCEL command options

You can use the CANCEL command to request an automatic restart.

Specify the following parameter:

RESTART={NO∨YES}
: Terminate the server immediately, specifying whether or not automatic restart should be requested. The default is RESTART=NO.

  If the server encounters an unrecoverable problem with the coupling facility connection, consisting either of lost connectivity or a structure failure, it cancels itself using the CANCEL RESTART=YES command. This terminates the existing connection and shuts down the server. A new instance of the server job is then started.

  A server can also be restarted explicitly using either the server command CANCEL RESTART=YES or the MVS command CANCEL jobname,ARMRESTART.

  You can also enter RESTART on its own for RESTART=YES, NORESTART for RESTART=NO.

Unloading and reloading queue pools

The contents of a queue pool can be unloaded to a sequential file and subsequently reloaded by running the server program using the FUNCTION parameter.

About this task

This can be used to preserve the queue pool across planned coupling facility maintenance, or to move the queue pool to a different coupling facility. The server does not support automatic structure REBUILD, but the unload and reload process is more flexible. The reloaded queue pool does not need the same name as the original pool.

FUNCTION={UNLOAD|RELOAD}
: requests the server to perform the special functions UNLOAD or RELOAD. When the unload or reload processing has completed (normally or abnormally) the server program terminates.

  If this parameter is omitted, the server program initializes the cross-memory queue server environment.

When UNLOAD or RELOAD is specified, the server program requires exclusive use of the list structure. If the structure is currently being used by a normal server, the attempt to unload or reload is rejected. Similarly, if a normal server attempts to start up while an unload or reload function is in progress, the attempt is rejected because shared access to the structure is not available.

All normal server parameters can be specified on UNLOAD and RELOAD, but many of these, such as the number of queue buffers, are ignored because they do not apply to unload or reload processing.

The UNLOAD function requires a DD statement for file name DFHXQUL describing the sequential data set to which the queue pool is to be unloaded. The format of the unloaded file is:

```
    RECFM=F,LRECL=4096,BLKSIZE=4096.
```

An upper limit for the total size of the data set in bytes can be estimated from the pool usage statistics produced by the server. The total data size in bytes is obtained by multiplying the number of elements in use by the element size (usually 256), and for each queue there is also some control information which typically occupies fewer than 100 bytes per queue. The size is normally smaller than this because unused space in data elements is not included in the unloaded file. See Figure 31 for an example of UNLOAD JCL.

```
//UNLDTSQ1 JOB  ...
//TSUNLOAD EXEC PGM=DFHXQMN         CICS TS queue server program
//STEPLIB  DD   DSN=CICSxxx.SDFHAUTH,DISP=SHR   Authorized library
//SYSPRINT DD   SYSOUT=*            Options, messages and statistics
//DFHXQUL  DD   DSN=TSQ1.UNLOADED.QPOOL,   Unloaded queue pool
//         DISP=(NEW,CATLG),
//         SPACE=(4096,(10000,1000))    Estimated size in 4K blocks
//SYSIN    DD   *
FUNCTION=UNLOAD                     Function to be performed is UNLOAD
POOLNAME=PRODTSQ1                   Pool name
/*
```

Figure 31. Example of UNLOAD JCL

The RELOAD function requires a DD statement for file name DFHXQRL describing the sequential data set from which the queue pool is to be reloaded. The structure is allocated if necessary during reloading, in which case the same server parameters may be used to control structure attributes as for normal server execution. The RELOAD process bypasses any queues that are already found in the queue pool, because, for example, the structure was too small and the reload job had to be restarted after using ALTER to increase the size.

Note that when a pool is nearly full (with less than about 5% free entries and elements) there is no guarantee that it can be unloaded and reloaded into a structure of exactly the same size. The amount of space available is affected by the current ratio of entries to elements, which can only be controlled approximately by the automatic ALTER process.

If the structure reaches the warning level during reloading, the automatic ALTER process attempts to adjust the entry to element ratio, and the reload process will automatically wait for the ALTER to complete if no space is available while an ALTER is still in progress.

If RELOAD fails because it runs out of space, the resulting messages include the numbers of queues reloaded and blocks read up to the time of the failure. Compare these values with those in the messages from the original UNLOAD to determine how many more queues and how much more data remained to be loaded. See Figure 32 on page 343 for an example of RELOAD JCL.

```
//RELDTSQ1 JOB  ...
//TSRELOAD EXEC PGM=DFHXQMN         CICS TS queue server program
//STEPLIB  DD   DSN=CICSxxx.SDFHAUTH,DISP=SHR   Authorized library
//SYSPRINT DD   SYSOUT=*            Options, messages and statistics
//DFHXQRL  DD   DSN=TSQ1.UNLOADED.QPOOL,DISP=OLD  Unloaded queue pool
//SYSIN    DD   *
FUNCTION=RELOAD                     Function to be performed is RELOAD
POOLNAME=PRODTSQ1                   Pool name
POOLSIZE=50M                        Increased pool size
MAXQUEUES=10000                     Increased number of big queues
/*
```

Figure 32. Example of RELOAD JCL

Chapter 22. Setting up and running a coupling facility data table server

CICS coupling facility data tables provide rapid sharing of working data within a sysplex, with update integrity. The data tables are held in coupling facility structures, with access through a named server. You must set up one server for each pool in an MVS image.

Before you begin

Before you can start a server for named coupling facility data table pool, define the coupling facility structure to be used for the pool. See "Defining a coupling facility data table pool" on page 349 for information about defining a coupling facility list structure.

About this task

You can put related groups of coupling facility data tables in separate pools; for example, you might want to have one pool for production and another for test. A pool is defined as a list structure in the coupling facility resource management (CRFM) policy. The pool name is used to form the server name with the prefix DFHCF and is specified in the startup JCL for the server.

Procedure

1. Define and start a coupling facility data table server job, to run in an mvs batch region.
2. When the server is running you can perform various operating tasks:
   - You can control the server region using MVS commands.
   - You can delete or empty the pool for the coupling facility data tables.
   - You can unload and reload the contents of a pool to and from a sequential data set.

Overview of a coupling facility data table server

CICS coupling facility data tables is designed to provide rapid sharing of working data within a sysplex, with update integrity.

The data is held in a table that is similar in many ways to a shared user-maintained data table, and the API used to store and retrieve the data is based on the file control API used for user-maintained data tables.

Figure 33 on page 346 illustrates a Parallel Sysplex with three CICS AORs linked to the coupling facility data table servers.

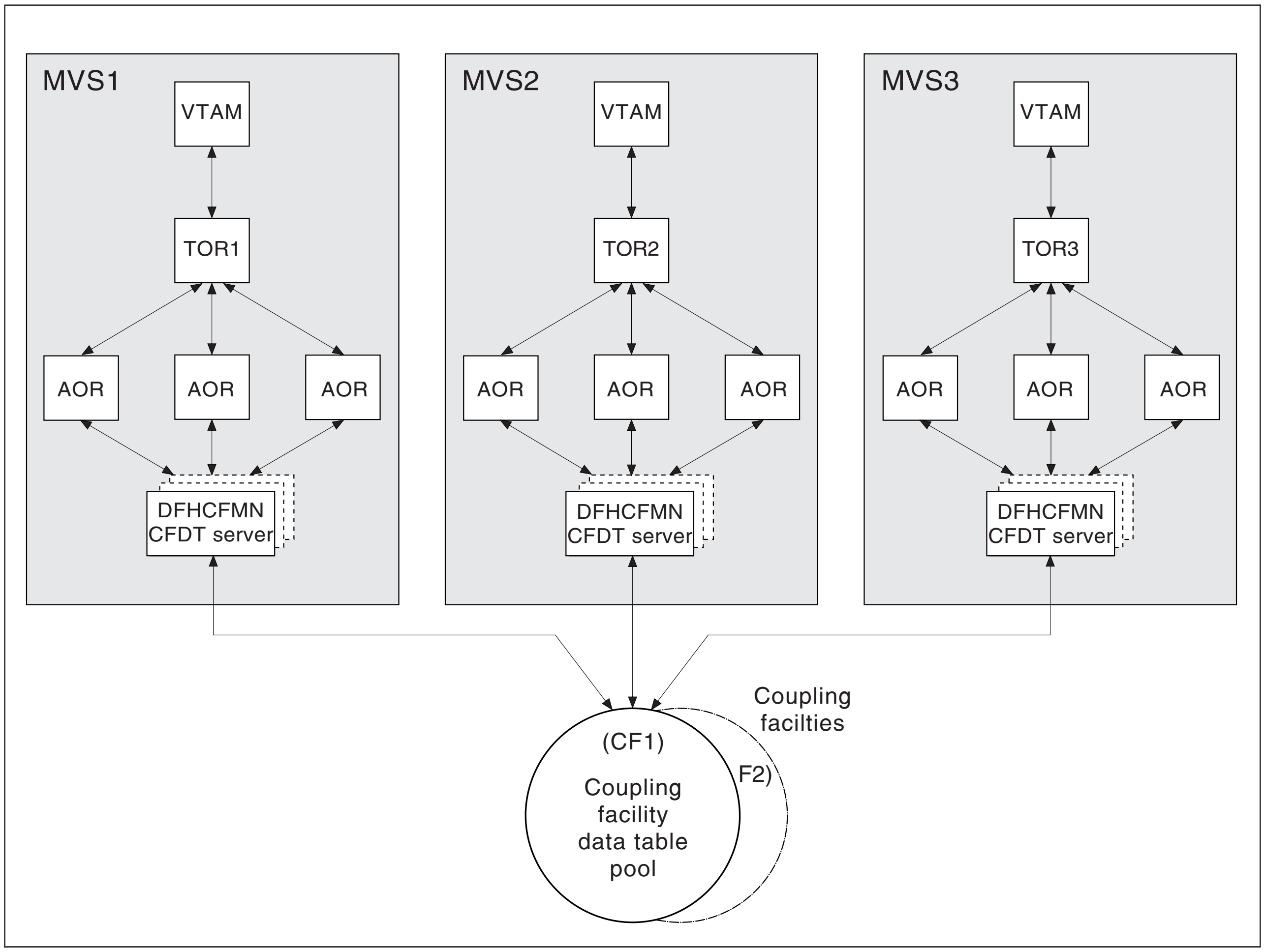


Figure 33. Conceptual view of a Parallel Sysplex with coupling facility data table servers

Coupling facility data tables

Coupling facility data tables (CFDTs) provide a method of file data sharing, using CICS file control, without the need for a file-owning region, and without the need for VSAM RLS support. CICS CFDT support provides rapid sharing of working data within a sysplex, with update integrity.

The data is held in a coupling facility, in a table that is similar to a shared user-maintained data table. You must define the resources required for CFDTs in an MVS coupling facility resource management (CFRM) policy.

Because read access and write access have similar performance, this form of table is useful for scratchpad data. Typical uses might include sharing scratchpad data between CICS regions across a sysplex, or sharing of files for which changes do not have to be permanently saved. There are many different requirements for scratchpad data, and most of these can be implemented using CFDTs.

CFDTs are useful for grouping data into different tables, where the items can be identified and retrieved by their keys. For example:

- You can use a field in a CFDT to maintain the next free order number for use by an order processing application.

- You can maintain a list of the numbers of lost credit cards in a CFDT.

To an application, a CFDT appears much like a sysplex-wide user-maintained data table, because it is accessed in the same way, by using the file control API. However, in a CFDT there is a maximum key-length restriction of 16 bytes.

Coupling facility data table models

CFDTs can use the contention model or the locking model. You specify the model that each table uses on its file resource definition, so different tables can use different models.

- The contention model gives optimal performance but generally requires programs written to exploit it. This is because the CHANGED condition code (which indicates that the data has changed since the application program issued a read-for-update request) is specifically for this model. Programs that are not written for the contention model might not be able to handle this condition correctly. The CHANGED response can occur on a REWRITE or DELETE command. There is also a situation with the contention model in which the NOTFND response can be returned on a REWRITE or DELETE.

  This model is nonrecoverable: CFDT updates are not backed out if a unit of work fails.
- The locking model is API-compatible with programs that conform to the UMT subset of the file control API (this subset is almost the full file control API). This model can be one of the following:
  - Nonrecoverable.

    Locks do not last until syncpoint, and CFDT updates are not backed out if a unit of work fails.
  - Recoverable.

    CFDTs are recoverable after a unit-of-work failure or a CICS region failure (updates made by units of work that were in-flight at the time of the CICS failure are backed out).

    The recoverable locking model supports indoubt and backout failures. If a unit of work fails when backing out an update to the CFDT, or if it fails indoubt during syncpoint processing, the locks are converted to retained locks and the unit of work is shunted.

Server connections

A client CICS region establishes a single cross-memory connection to a server the first time a request refers to the pool for that server. If the server connection fails, there are implications for coupling facility data tables. See "Server connection management" on page 407 and Named counter recovery.

Coupling facility data table structures and servers

Coupling facility data tables (CFDTs) are held in coupling facility list structures. Access to a CFDT is through a named CFDT server.

The CFDT server can be thought of as similar to a shared data tables file-owning region. For information about shared data tables support, see the *CICS Shared Data Tables Guide*. You can use CFDT support to separate related groups of CFDTs by storing them in separate pools. For example, you can have one pool for production and another for test.

A CFDT pool is a coupling facility list structure, and access to it is provided by a coupling facility data table server. Within each MVS image, there must be one CFDT server for each CFDT pool accessed by CICS regions in the MVS image.

The names of the servers are formed by adding the server address space name to the pool name. For example, for FACILTY class RACF profiles, the server name is DFHCF.*poolname*.

Coupling facility list structures are defined in the coupling facility resource management (CFRM) policy. Structure names for CFDTs take the form DFHCFLS_*poolname*. The CFDT pool name is then specified in the startup JCL for the CFDT server.

Access using file control API

A CFDT is accessed from CICS through file control commands.

The file name specified on the command indicates the name of the table and pool in which it resides. The table name is either specified on the file definition or is the same as the file name, and the pool name is specified on the file definition. The table is uniquely identified by the pool name and table name, so that two tables with the same name can exist in different pools, and are entirely separate entities.

Automatic connection to CFDT pools

CICS connects to the CFDT server for a given pool the first time that a CFDT in that pool is referenced. CICS also reconnects automatically to the CFDT server when the server restarts after a failure.

CFDT servers are protected against misuse by CICS regions that call them, thus ensuring system integrity. Protection is provided so that the calling region cannot modify sensitive parameters to authorized functions.

Similarly, CICS is protected from any side effects if a CFDT server fails. If a CICS region issues a file control request to a CFDT server that has failed, the resulting MVS abend is trapped and returned to the application program as a SYSIDERR condition.

CFDT creation and deletion

CICS automatically creates a coupling facility data table (CFDT) when a first reference requires the CFDT to be opened. This CFDT is then used by the same region, or other CICS regions, that issue subsequent open requests for other files that name the same coupling facility data table.

CICS can optionally load the CFDT automatically from a source VSAM (KSDS) data set when it is first opened. Unlike user-maintained data tables, with CFDTs you can specify that there is no associated source data set, allowing you to create an empty CFDT.

Your application programs have access to a CFDT as soon as it is created, although there are some restrictions on the keys that can be accessed while data is being loaded.

When a CFDT is loaded, it becomes an independent entity, separate from the behavior of the CICS regions that access the table, or caused the table to be loaded.

Even when all CICS regions have terminated, either normally or abnormally, a CFDT remains in the coupling facility until you take explicit action to delete the structure or the coupling facility.

To delete the CFDT contents or structure, you can use the following command:

```
MODIFY cfdt_server, DELETE TABLE=name
```

CFDT administration

CICS provides some utility functions that you can use to obtain summary information and periodic statistics from a coupling facility data table server about CFDTs defined in a pool. See Coupling facility data table statistics and Coupling Facility Data Table Pools report.

You can use this information when you administer coupling facility data table pools, and to evaluate capacity. See “Coupling facility data table server parameters” on page 353 for details.

Defining a coupling facility data table pool

You define the list structure for a coupling facility data table (CFDT) in a coupling facility resource manager (CFRM) policy in a sysplex couple data set.

CICS accesses a CFDT pool, which can contain one or more CFDTs, through a server region using cross-memory services. For information about setting up and starting a coupling facility data table region, see Chapter 22, “Setting up and running a coupling facility data table server,” on page 345.

From the application perspective, a pool and its server are similar to a file-owning region, and the pool can contain any number of tables, provided that each table has a unique table name.

Before a CFDT server can use its pool, the active CFRM policy must contain a definition of the list structure to be used for the pool. The CFRM structure definition specifies the size of the list structure and the preference list of coupling facilities in which it can be stored. You must add a statement that specifies the list structure to a selected CFRM policy, and then activate the policy.

You use the CFRM policy definition utility, IXCMIAPU, to specify the size of the list structures required, and their placement in a coupling facility.

You create the name of the list structure for a CFDT pool by adding the prefix DFHCFLS_ to the pool name, giving DFHCFLS_*poolname*.

Using IXCMIAPU to update a policy

You can use the administrative data utility, IXCMIAPU, to update an administrative policy in the CFRM couple data set. The utility adds or changes policy data in the administrative policies only: it does not change any information in the system copy of the active CFRM policy.

For an example of a job to run this utility, see member IXCCFRMP in the SYS1.SAMPLIB library (see the information about the administrative data utility for CFRM policy data in *z/OS MVS Setting Up a Sysplex*).

The following example shows a policy statement for a coupling facility data table pool.

```
STRUCTURE NAME(DFHCFLS_PRODCFT1)
   SIZE(79872)
   INITSIZE(32768)
   PREFLIST(FACIL01,FACIL02)
```

Activating a CFRM policy

After you define a CFRM policy, you must activate that policy. Use the following MVS command:

```
SETXCF START,POLICY,POLNAME=policyname,TYPE=CFRM
```

Activating a CFRM policy that contains a definition of a list structure does not create the structure. The structure is created the first time an attempt is made to connect to it, which occurs when the first coupling facility data table (CFDT) server that refers to the corresponding pool is started.

When the CFDT server creates a list structure, the structure is allocated with an initial size, which can be increased up to a maximum size, as specified in the CFRM policy. All structure sizes are rounded up to the next storage increment for the coupling facility level (CFLEVEL) at allocation time. For example, sizes are rounded up to the nearest 1 MB for CFLEVEL 16.

Provided that space is available in the coupling facility, you can dynamically expand a list structure from its initial size up to its maximum size, or contract it to free up coupling facility space for other purposes.

If the initial structure allocation becomes full, the structure does not expand automatically, even if the structure allocated is less than the specified maximum size. To expand a list structure when the allocation becomes full, you can expand it (up to its maximum size) using the following **SETXCF** command:

```
SETXCF START,ALTER,STRNAME=DFHCFLS_poolname,SIZE=nnnn
```

If you dynamically increase the size of a list structure in this way, also update the CRFM **INITSIZE** parameter to reflect the new size, so that the structure does not revert to its original size if you subsequently recreate or reload it.

Storage calculations for coupling facility data tables

You can use the System z Coupling Facility Structure Sizer tool (CFSizer) to calculate storage requirements for data tables list structures in a coupling facility.

A coupling facility structure contains both stored data and the information needed to manage and access that data, in a similar way to a key-sequenced data set. The data for each entry in the coupling facility is stored as a chain of fixed-size (usually 256-byte) elements, which means that the exact length for variable-length data must be stored separately. To do this, CICS includes a length prefix in the stored data, so space calculations must allow for each entry using a whole number of elements. The amount of internal control information depends on the level of functionality and performance of the coupling facility control code for the current coupling facility level (CFLEVEL). The storage requirements can increase for a higher CFLEVEL. For more information, see "Coupling facility storage management" on page 404.

CFSizer is a web-based application that takes these factors into account and communicates with a coupling facility at a current CFLEVEL to calculate storage requirements. See CFSizer.

To use CFSizer to calculate storage requirements for data table list structures, enter the following information:

Maximum number of tables
: The maximum number of data tables that can be stored in the data tables structure. This value corresponds to the MAXTABLES server parameter. See "List structure parameters" on page 356.

  Specify a large enough number to handle all your data tables, but not so large that unused preallocated list headers use a large amount of coupling facility storage. The valid range is from 1 to 999999. The default is 1000.

Average rounded record size
: The average amount of storage required for each data record. Each record has a two-byte length prefix and is stored as one or more 256-byte elements. This value determines the entry to element ratio that is used to calculate the required structure size. The valid range is from 1 to 32768. The default is 512.

  If all data records are similar sizes, calculate this value by taking the average data size, adding two, and rounding up to the next multiple of 256. The amount of element storage required is two bytes more than the data record size because of the length prefix on each item.

  If data records are different sizes, round up each size first before you take the average. For example, if half the records are 100 bytes and half are 300, round up the sizes to 256 and 512 respectively, then average them. The resulting average rounded item size is 384, which is more accurate than using the average item size of 200 and then rounding it up to 256.

  Records in a contention model data table with a record length of up to 63 bytes are a special case. These records are stored in the entry adjunct area, so for average record length purposes, the data length is effectively zero.

Total records
: The total number of records to be stored in all data tables.

Target usage percent
: The percentage of the structure space that the given total number of items are expected to use. Specify a number in the range of 1 to 100. The default is 75. This value ensures the following:

  - Free space exists for temporary expansion.
  - If the initial free space is not enough, there is time to expand the structure in response to warning messages (which normally start at 80%).
  - Activity to alter entry to element ratios is reduced.

Maximum expansion percent
: The percentage that the structure can expand. If a non-zero value is specified, the maximum structure size will be greater than the initial structure size by an amount such that the total amount of data can increase by this percentage. For example, if the value 200 is specified, the initial size is enough to store the specified total number of items, and the maximum size is enough to store three times that number of items.

You use the results of these calculations to set the coupling facility resource manager (CFRM) **INITSIZE** and **SIZE** parameters in the CRFM policy.

For information about the CICS reserved space parameters that enable the coupling facility data table (CFDT) server to avoid a structure full condition, see "Reserved space parameters" on page 361 and "Avoiding structure full conditions" on page 362.

Defining and starting a coupling facility data table server region

You activate a coupling facility data table pool in an MVS image by starting up a coupling facility data table server region for that pool.

About this task

You can start the server as a started task, started job, or as a batch job. The job or task must invoke the coupling facility data table server region program, DFHCFMN, from an APF-authorized library. DFHCFMN is in the CICS authorized library, CICSTS42.CICS.SDFHAUTH.

Procedure

1. Specify the DFHCFMN program either in a SYSIN data set defined in the JCL, or in the **PARM** parameter on the EXEC statement.
2. Specify the mandatory and optional startup parameters for the DFHCFMN program. If you specify a startup parameter in both the SYSIN data set and the **PARM** parameter, the **PARM** value overrides the SYSIN value because the **MVS START** command can override the **PARM** value.
   a. You must specify a SYSPRINT DD statement for the print file.
   b. You must specify a SYSIN DD statement for the server parameters.
   c. You must specify the TS pool name.
   d. It is recommended that you specify the **REGION** parameter. This parameter ensures that the coupling facility data table server region has enough storage to process the maximum number of data table requests that can run concurrently.
   e. It is recommended that you specify TIME=NOLIMIT. The server task remains in a wait during most normal processing, because server processing is performed under the TCB of the client CICS region. If you omit this parameter, your server job could fail with abend S522 (wait limit exceeded), depending on the JWT value specified in the SMFPRM*xx* member of SYS1.PARMLIB.
   f. Specify additional parameters as required. For example, you might want to control the maximum number of queues that are to be supported in the pool and the number of buffers the server is to allocate.

Results

Tip: The easiest way to ensure that all pool-related parameters are consistent across MVS images is to use the same SYSIN parameter data set, or an identical copy of it, for all servers accessing the same pool, and to specify in the PARM field any parameters that vary between servers.

Coupling facility data table server JCL example

```
//PRODCFD1 JOB  ...
//CFSERVER EXEC PGM=DFHCFMN,REGION=40M,TIME=NOLIMIT    CICS CFDT Server
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR    Authorized library
//SYSPRINT DD   SYSOUT=*                               Messages and statistics
//SYSIN    DD   *
POOLNAME=PRODCFD1                                      Pool name
MAXTABLES=100                                          Allow up to 100 tables
/*
```

Figure 34. Sample JCL to start a CFDT server address space

Coupling facility data table server parameters

Parameters are specified in the form KEYWORD=*value*, where keywords can optionally be specified in mixed case to improve readability.

If you specify more than one parameter in the PARM field or on the same SYSIN input line, the parameters must be separated by a comma. Any text following one or more spaces is taken as a descriptive comment. Any parameter line which starts with an asterisk or a space is assumed to be a whole line comment.

You can enter some parameter keywords in more than one form, such as in abbreviated or truncated form.

The main parameters are listed on the server print file during start-up.

The parameters are all valid as initialization parameters (in the SYSIN file or PARM field), and some can also be modified by the SET command.

REGION parameter

The JCL **REGION** parameter ensures that the coupling facility data table server region has enough storage to process the maximum number of data table requests that can run concurrently.

The number of coupling facility data table requests that each connected CICS region can have active at a time is limited to about 10. Each request requires about 40 KB, therefore the **REGION** size should specify at least 400 KB for each connected CICS region, plus a margin of about 10% for other storage areas. Thus, for a server supporting up to five CICS regions, specify REGION=2200K.

During server initialization, the server acquires all the available storage above 16 MB, as determined by the **REGION** parameter, then releases 5% of it for use by operating system services. It also acquires 5% of the free storage below 16MB for use in routines that require 24-bit addressable storage, for example sequential file read and write routines.

After initialization, the server uses AXM page allocation services to manage its storage. Server statistics indicate how much storage is allocated and used within the storage areas above and below 16 MB, which are called AXMPGANY and AXMPGLOW in the statistics.

If a task in the server region or a cross-memory request runs out of storage, this is likely to result in AXM terminating that task or request using a simulated abend with system completion code 80A to indicate a GETMAIN failure. Although the server can usually continue processing other requests in this case, running out of storage in a critical routine can cause the server to terminate. Therefore, it is best to ensure that the **REGION** size is large enough to eliminate this risk.

Pool name parameter

This parameter, POOLNAME, is always required:

POOLNAME=*name*

specifies the 8-character name of the coupling facility data table pool. This is appended by the server to the prefix DFHCF to create its own server name, as in DFHCF.*poolname*, and also to the prefix DFHCFLS_ to create the name of the coupling facility list structure, as in DFHCFLS_*poolname*.

This parameter is valid only at server initialization, and must always be specified.

This keyword can be abbreviated to **POOL**.

Security parameters

You can use the security parameters to specify whether to use the optional security mechanism that the server provides, to check that CICS regions are authorized to open a coupling facility data table. You can also use these parameters to override standard processing for this optional security.

SECURITY={<u>YES</u>|NO}

Specifies whether individual coupling facility data table security checks are required.

<u>YES</u> The server performs a security check against each CICS region that attempts to open a coupling facility data table. Access is controlled through profiles defined in the general resource class named on the **SECURITYCLASS** parameter.

This function requires an external security manager, such as RACF, that supports the FASTAUTH function in cross-memory mode.

NO The server does not perform a security check against each CICS region that attempts to open a coupling facility data table.

This is the only security check performed by the server that is optional. The other file security checks are always performed by the server, as described in Security for coupling facility data tables in the RACF Security Guide.

This parameter is valid only at server initialization.

This keyword can be abbreviated to **SEC**.

SECURITYCLASS={<u>FCICSFCT</u>|*class*}

Specifies the name of the RACF general resource class that the server is to use for security checks on coupling facility data table access by CICS regions. The name can be up to 8 characters, and is the name of the class in which the CFDT resource profile and its access list are defined.

This parameter is valid only at server initialization.

This keyword can be abbreviated to **SECCLASS**.

SECURITYPREFIX={<u>NO</u>|YES}

When SECURITY=YES is specified, specifies whether the resource name that is passed to RACF for the coupling facility data table security check is prefixed with the server region user ID.

Note: For this security check, the resource name used by the server is the either the name specified on the TABLENAME attribute of the CICS file resource definition, or the FILE name if TABLENAME is not specified.

YES The server prefixes the resource name with the server region user ID (the default) or an alternative prefix specified on the **SECURITYPREFIXID** parameter.

NO The server passes to RACF only the 8-character resource name, without any prefix.

This parameter is valid only at server initialization.

This keyword can be abbreviated to **SECPREFIX** or **SECPRFX**.

SECURITYPREFIXID=*identifier*

Specifies a prefix for the server to use for security checks on coupling facility data table access by CICS regions, instead of the server region user ID. The prefix can be up to 8 characters, and should correspond to the prefix used to define profile names of CFDTs to RACF. This parameter is effective only when SECURITYPREFIX=YES is specified.

This parameter is valid only at server initialization.

This keyword can be abbreviated to **SECPREFIXID**.

Related links

Security for coupling facility data tables in the RACF Security Guide

Statistics parameters

Use the following parameters to specify server statistics options:

ENDOFDAY={00:00|*hh:mm***}**

specifies the time of day, in hours and minutes, when the server is to collect and reset end-of-day statistics.

Note: If the STATSOPTIONS parameter specifies NONE, the server still writes end-of-day statistics to the print file.

The valid range of times is from 00:00 to 24:00.

This keyword can be abbreviated to **EOD**.

STATSINTERVAL={03:00|*hh:mm***}**

specifies the statistics collection interval, in the range 1 minute to 24 hours. This parameter is ignored if the STATSOPTIONS parameter specifies NONE.

The time interval can range from 00:01 to 24:00.

This keyword can be abbreviated to **STATSINT**.

STATSOPTIONS={NONE|SMF|PRINT|BOTH}

specifies whether the server is to produce interval statistics, and the destination for the statistics it produces.

NONE
The server does not produce any interval statistics.

SMF The server produces interval statistics and writes them to the current SMF data set only.

PRINT
The server produces interval statistics and writes them to the server's print file only.

BOTH The server produces interval statistics and writes them to the current SMF data set and to the server's print file.

This keyword can be abbreviated to **STATSOPT**.

Automatic restart manager (ARM) parameters

During server initialization, the server unconditionally registers with ARM except when the server program is invoked with either the UNLOAD or the RELOAD functions. The server will not start if the registration fails.

Use the following parameters to override default processing for the automatic restart manager:

ARMELEMENTNAME=*elementname*

specifies the automatic restart manager element name, up to 16 characters, to identify the server to ARM for automatic restart purposes. The permitted characters for the element name are A to Z 0-9 $ # @ and the underscore symbol (_).

The default identifier is of the form DFHCF*nn_poolname*, where CF represents the server type, *nn* is the &SYSCLONE value for the system (which can be either one or two characters), and *poolname* is the name of the pool served by the server.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMENT** or **ARMELEMNAME**.

ARMELEMENTTYPE=*elementtype*

specifies the automatic restart manager element type, up to 8 characters for use in ARM policies as a means of classifying similar elements. The permitted characters for the element type are A to Z 0-9 $ # and @.

The default element type is SYSCICSS.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMTYPE**.

List structure parameters

The list structure parameters specify the attributes that are used only for initial allocation of the data tables list structure for a for a coupling facility data table (CFDT) pool. Initial allocation occurs the first time a server is started for the CFDT pool.

The list structure parameters are as follows:

MAXTABLES={1000|*number***}**

Specifies the maximum number of data lists to be reserved when the structure is allocated, which determines the maximum number of tables that can be stored in the structure. This parameter also determines how many list headers are defined when the structure is created.

Specify a large enough number to handle all your data tables, but not so large that unused preallocated list headers use a large amount of coupling facility storage.
You cannot change this number without reallocating the structure, which means first deleting the existing structure (see “Deleting or emptying coupling facility data table pools” on page 369). Therefore, if the structure is being allocated at less than its maximum size, the value here should be based on the maximum possible size of the structure rather than its initial size.
This parameter corresponds to the “Maximum number of tables” value in the

CFSizer tool (see "Storage calculations for coupling facility data tables" on page 350).
This parameter is valid only at server initialization and is used only when the structure is first allocated. The valid range is from 1 to 999999.
You can abbreviate this keyword to **MAXT**.

Note: In addition to the data lists defined by **MAXTABLES** there are control lists used internally by CICS so the total number of lists is greater than the number specified in **MAXTABLES**.

POOLSIZE={0|*number*{K|M|G}}
Specifies the initial amount of coupling facility storage to be allocated for the pool list structure, expressed as kilobytes (*n* K), megabytes (*n* M) or gigabytes (*n* G).

Usually, you can omit this parameter and specify the structure size by using the **INITSIZE** parameter in the coupling facility resource manager (CFRM) policy. However, this parameter can be useful if the structure is reallocated or reloaded but the CFRM policy has not been updated to reflect the required size.

0 The special value 0 means that the server obtains an initial allocation using the parameters specified in the CFRM policy. If the CFRM policy specifies an **INITSIZE** value for the structure, this determines the initial allocation. Otherwise, the CFRM **SIZE** value (the maximum size of the structure) is allocated.

number
A non-zero value specifies an initial amount of storage to be allocated, overriding the **INITSIZE** parameter in the CFRM policy. This value is rounded up by MVS to the next storage increment for the coupling facility level (CFLEVEL). For example, for CFLEVEL 16, the value is rounded up to the nearest 1 MB.

The value must be less than the CFRM **SIZE** parameter, otherwise the value of **POOLSIZE** is ignored and the initial allocation uses the parameters specified in the CFRM policy.

| The valid range is from 0 to 16777215M. However, you must specify a
| value that is less than the maximum size of a structure in z/OS,
| otherwise a z/OS error occurs. For example, in z/OS, Version 1
| Release 12, the maximum size of a structure is 1048576 MB (1 TB). For
| more details, see the information about CFRM parameters in *z/OS MVS*
| *Setting Up a Sysplex*.

This parameter is valid only at server initialization and is used only when the structure is first allocated.

Debug trace parameters

These parameters are provided only for intensive debug tracing.

Using these options in a production environment could have a significant impact on performance and cause the print file to grow very rapidly, using up spool space.

Trace messages from cross-memory requests can be lost if they are generated faster than the trace print subtask can print them. In this event, the trace only indicates how many messages were lost.

CFTRACE={OFF|ON}
specifies the coupling facility interface debug trace option.

OFF Coupling facility interface debug trace is disabled.

ON Coupling facility interface debug trace produces trace messages on the print file, indicating the main parameters to the coupling facility request interface, and the result from the IXLLIST macro.

This keyword can also be specified as **TRACECF**.

RQTRACE={OFF|ON}
specifies the table request debug trace option.

OFF Table request debug trace is disabled.

ON Table request debug trace produces trace messages on the print file, indicating the main parameters on entry to each cross-memory request, and the results on exit.

This keyword can also be specified as **TRACERQ=**.

Tuning parameters

These parameters are provided for tuning purposes, but usually you can omit them and let the coupling facility data table (CFDT) server use the default values.

ELEMENTRATIO={1|*number*}
An MVS coupling facility resource management (CFRM) parameter that specifies the element part of the entry-to-element ratio when the structure is first allocated. This value determines the proportion of the structure space that is initially set aside for data elements.

The ideal value for the entry-to-element ratio is the average size of data for each entry divided by the element size. However, the server automatically adjusts the ratio according to the actual entry and element usage.

This parameter is valid only at server initialization, and is used only when the structure is first allocated. The valid range is from 1 to 255.

You can abbreviate this keyword to **ELEMRATIO**.

For further information about this parameter in the coupling facility, see *z/OS MVS Programming: Sysplex Services Guide*.

ELEMENTSIZE={256|*size*}
An MVS CFRM parameter that specifies the data element size for the list structure, which must be a power of 2. This parameter is used only for coupling facility log streams. For current coupling facility implementations, there is no reason to use any value other than the default value of 256.

This parameter is valid only at server initialization and is only used when the structure is first allocated. The valid range is from 256 to 4096.

You can abbreviate this keyword to **ELEMSIZE**.

ENTRYRATIO={1|*number*}
An MVS CFRM parameter that specifies the entry part of the entry-to-element ratio when the structure is first allocated. This value determines the proportion of structure space that is initially set aside for list entry controls.

It is not essential to specify this parameter because the server automatically adjusts the ratio, based on actual usage, to improve space utilization if necessary.

This parameter is valid only at server initialization and is used only when the structure is first allocated. The valid range is from 1 to 255.

For further information about this parameter in the coupling facility, see *z/OS MVS Programming: Sysplex Services Guide*.

Lock wait parameters

Use these parameters to modify the time intervals for the server lock wait retry mechanism.

This is provided mainly as a "wake-up" mechanism to ensure that requests waiting for a record lock do not wait indefinitely in certain rare cases where a system failure or structure full condition could cause a lock release notification message to be lost. In addition, this mechanism also ensures that if a CICS task is purged while it has a request waiting for a lock, the waiting request in the server is woken up as soon as the lock wait retry interval expires. The request process then finds that the CICS task is no longer waiting for it, therefore it terminates rather than continuing to wait and hold on to server resources until the lock becomes free.

There are two times involved: a scan time interval and a wait time. The server starts its lock scan interval timing when the first request is made to wait.

This mechanism has very little effect on normal processing and the default lock wait retry parameter values are designed to suit the majority of installations.

LOCKSCANINTERVAL={5|*number*}

specifies the time interval after which requests waiting for record locks are scanned to check for lock wait timeout.

This affects the overall duration of the lock wait timeout, because a request that starts waiting for a lock during a given scan interval is timed as if from the start of the interval. The lock scan interval should be less than the lock wait interval, and ideally should be such that the lock wait interval is an exact multiple of the lock scan interval.

You can specify this value as a number of seconds or in the time format *hh:mm:ss*.

The valid range is from 1 (1 second) to 24:00 (24 hours).

This keyword can be abbreviated to **LOCKSCANINT**.

LOCKWAITINTERVAL={10|*number*}

specifies the maximum time that a request should wait for a record lock before being reinvoked to retry. The actual time a request waits depends on how far into a scan interval it started its wait. For example, in a server using the scan and wait default intervals, if 4 seconds have already elapsed when a request starts to wait, the maximum time it can wait is 6 seconds. When the server checks the timeout value for the request, it assumes that the request has been waiting for the full scan period. Thus, for the default values, a request is reinvoked to retry after waiting between five and ten seconds.

This value can either be specified as a number of seconds or in time interval format *hh:mm:ss*.

The valid range is from 1 (1 second) to 24:00 (24 hours).

This keyword can be abbreviated to **LOCKWAITINT**.

Warning parameters

Use these parameters to modify the thresholds at which warning messages are issued, and an automatic structure alter occurs, when the structure becomes nearly full.

ELEMENTWARN={<u>80</u>|*number*}
: specifies the percentage of list structure elements in use at which warning messages and an automatic structure alter should be first triggered.

  The valid range is from 1 to 100 per cent.

  This keyword can be abbreviated to **ELEMWARN**.

ELEMENTWARNINC={<u>5</u>|*number*}
: specifies the percentage increase (or decrease) of elements in use before the next warning message should be triggered (reduced to 1 when the next increase would otherwise reach 100). After the first warning, additional messages are issued as the number of elements increases and decreases. These messages stop when the number of elements in use has fallen at least this percentage below the initial warning level.

  The valid range is from 1 to 100 per cent.

  This keyword can be abbreviated to **ELEMWARNINC**.

ENTRYWARN={<u>80</u>|*number*}
: specifies the percentage of list structure entries in use at which warning messages and an automatic structure alter action should be first triggered.

  The valid range is from 1 to 100 per cent.

ENTRYWARNINC={<u>5</u>|*number*}
: specifies the percentage increase (or decrease) of entries in use before the next warning message should be triggered (reduced to 1 when the next increase would otherwise reach 100). After the first warning, additional messages are issued as the number of elements increases and decreases. These messages stop when the number of entries in use has fallen at least this percentage below the initial warning level.

  The valid range is from 1 to 100 per cent.

Automatic structure alter parameters

Use these parameters to modify the conditions under which the server attempts an automatic alter when the structure becomes nearly full.

For information about the structure alter process, see "Coupling facility data table server automatic structure alter" on page 363.

ALTERELEMMIN={<u>100</u>|*number*}
: specifies the minimum number of excess elements that must be present to cause the server to issue an automatic alter to convert those elements to entries.

  The valid range is from 0 to 999999999.

ALTERELEMPC={<u>5</u>|*number*}
: specifies the minimum percentage of excess elements that must be present to cause the server to issue an automatic later to increase the proportion of entries.

  The valid range is from 0 to 100 per cent.

ALTERENTRYMIN={100|*number*}
specifies the minimum number of excess entries that must be present to cause the server to issue an automatic alter to convert those entries to elements.

The valid range is from 0 to 999999999.

ALTERENTRYPC={5|*number*}
specifies the minimum percentage of excess entries that must be present to cause the server to issue an automatic alter to increase the proportion of elements.

The valid range is from 0 to 100 per cent.

ALTERMININTERVAL={00:10|hh:mm}
specifies the minimum time interval to be left between automatic structure alter attempts when the structure is nearly full (above the element or entry warning level). This is to prevent excessive numbers of alter attempts to try to optimize space when the structure is nearly full.

The valid range is from 00:00 to 24:00.

This keyword can be abbreviated to **ALTERMININT**.

Reserved space parameters

Use these parameters to control the amount of structure space that is reserved for rewrites and server internal operations (such as tracking units of work and notifying other servers when a lock is released).

For information about the effect of these parameters, see "Avoiding structure full conditions" on page 362.

ELEMENTRESERVEMIN={300|*number*}
specifies the minimum number of list structure data elements (normally 256 bytes each) to be reserved for rewrites and server internal operations.

The valid range is from 0 to 999999999.

This keyword can be abbreviated to **ELEMRESERVEMIN**.

ELEMENTRESERVEPC={5|*number*}
specifies the percentage of list structure data elements to be reserved for rewrites and internal server use. If this percentage evaluates to less than the minimum number specified on the ELEMENTRESERVEMIN parameter, the minimum number is used instead.

The valid range is from 0 to 100.

This keyword can be abbreviated to **ELEMRESERVEPC** or **ELEMRESPC**.

ENTRYRESERVEMIN={100|*number*}
specifies the minimum number of list structure entries to be reserved for rewrites and server internal operations.

The valid range is from 0 to 999999999.

This keyword can be abbreviated to **ENTRYRESMIN**.

ENTRYRESERVEPC={5|*number*}
specifies the percentage of list structure elements to be reserved for rewrites and internal server use. If this percentage evaluates to less than the minimum number specified on the ENTRYRESERVEMIN parameter, the minimum number is used instead.

The valid range is from 0 to 100.

This keyword can be abbreviated to **ENTRYRESPC**.

Avoiding structure full conditions

If the coupling facility data table structure is allowed to become completely full, this not only prevents the addition of new records or tables, but can also have a significant impact on performance and application function.

In particular, rewrite requests can be rejected even when the size of the new data is less than or equal to the original, and server internal operations can fail, causing internal time-outs and retries.

The parameters ELEMENTRESERVEMIN, ELEMENTRESERVEPC, ENTRYRESERVEMIN and ENTRYRESERVEPC are provided to reduce the risk of the structure becoming totally full, by reserving a number of entries and elements, which can only be used for operations that normally only need extra space temporarily, such as rewrites or unit of work control operations. If a server is asked to write a new record or create a new table when the number of entries or elements remaining in the structure (as returned by each coupling facility access request) is less than or equal to the specified reserve level, the request is rejected with an indication that no space is available. Before rejecting the request, the server issues a dummy read request in order to find out the latest usage levels for the structure, in case more space has recently become available.

Using the reserved space parameters means that, even if the structure fills up very rapidly (for example, because a table is being loaded that is too large for the available space), enough space should remain to allow rewrites of existing records and allow internal communication between servers to continue normally.

Note that this mechanism cannot prevent the structure from eventually becoming totally full, as recoverable rewrites are allowed to use the reserved space temporarily, and rewrites that increase the data length will gradually use up the reserved elements. If action is not taken to prevent the structure from becoming totally full, the following effects can occur:

- An attempt to close a table or change the table status could encounter a temporary structure full condition. In this case, the attempt is retried indefinitely, because it must be completed in order to preserve table integrity (the only alternative being to terminate the server). The retry process normally succeeds quickly, but there is a theoretical case where this can cause a loop until another server causes temporarily unavailable resources to be released.
- Rewrites with the same (or smaller) data size for a table using the contention update model are retried indefinitely if they initially fail because of a structure full condition. This is done to protect the application against having to handle this unexpected form of failure. Again, the retry should normally succeed quickly, but there is a theoretical possibility that this could loop for a while.
- Rewrites for a table using the locking or recoverable update model could be rejected with a structure full condition even if the data size is not increased. No retry is attempted in this case.
- Units of work can be backed out because the server is unable to create unit of work control entries for commit processing.
- There may not be sufficient structure space to send lock release messages, in which case waiting tasks are not woken up immediately but continue to wait for up to the time-out interval specified on the LOCKWAITINTERVAL parameter before finding out that the lock has been released.

Coupling facility data table server automatic structure alter

The coupling facility data table server monitors the total number of elements and entries in use in the structure, using information returned by the coupling facility on every request.

When the numbers in use exceed the specified warning thresholds, the server issues a warning message, and this warning message is repeated each time the number in use increases beyond further thresholds.

Each time the server issues a warning, it also tests whether an automatic structure alter for the entry-to-element ratio should be issued. If any form of alter has already been issued recently (by any server or through an operator `SETXCF ALTER` command) and the structure space usage has remained above warning levels since the previous attempt, any further structure alter attempt is suppressed until at least the minimum interval (specified through the ALTERMININTERVAL parameter) has elapsed.

The server checks whether an automatic structure alter should be issued, by calculating how many excess elements or entries will be left when the other runs out completely, based on the ratio between the current numbers of elements and entries in use. If the number of excess elements or entries exceeds the number specified in the ALTERELEMMIN or ALTERENTRYMIN parameter, and the same number expressed as a percentage of the total exceeds the value specified in the ALTERELEMPC or ALTERENTRYPC parameter, an IXLALTER request is issued to alter the entry to element ratio to the actual current ratio between the number of entries and elements in use.

Only one alter request can be active at a time for a given structure. This means a server may well find that another server has already started the structure alter process, in which case its own alter is rejected. However, the system automatically notifies all servers when the structure alter is completed, giving the new numbers of elements and entries so that each server can update its own status information.

Controlling coupling facility data table server regions

You can issue commands to control a coupling facility data table server, using the **`MVS MODIFY (F)`** command to specify the job or started task name of the server region, followed by the server command.

About this task

The general form of a coupling facility data table server command, using the short form F, is as follows:

```
F job_name,command parameters... comments
```

You can use the following commands to control the coupling facility data table server region.

Procedure

- To modify the server initialization parameters, use the **`SET`** command:

  ```
  SET keyword=operand[,keyword=operand,...]
  ```

  The command can be abbreviated to **`T`**, as for the **`MVS SET`** command. See “The SET command options” on page 364 for details.

- To display the values of one or more parameter values or statistics summary information on the console, use the **DISPLAY** command:

  ```
  DISPLAY keyword[=operand][,keyword[=operand,]...]
  ```

  The valid keywords for **DISPLAY** are all the initialization parameters, plus an additional set described under “DISPLAY and PRINT command options” on page 366.

  The command can be abbreviated to **D**, as for the **MVS DISPLAY** command.
- To print the output that the **DISPLAY** command produces, use the **PRINT** command:

  ```
  PRINT keyword[=operand][,keyword[=operand,]...]
  ```

  The command produces the same output as DISPLAY, supporting the same keywords, but on the print file only.
- To delete a table, use the **DELETE TABLE**=*name* command. The table must not be in use for this command to succeed. You can abbreviate the command to **DEL**.
- To stop the server normally, use either the **STOP** command or the **MVS STOP** command. The server waits for any active connections to end first and prevents any new connections while it is waiting. The command can be abbreviated to **P**; for example `P jobname`.
- To request an automatic restart, use the **CANCEL** command. This command terminates the server immediately. You can specify whether the server will automatically restart. For information about **CANCEL RESTART** see “The CANCEL command options” on page 341.
- The server also responds to XES events such as an operator **SETXCF** command to alter the structure size. If the server can no longer access the coupling facility, it automatically issues a server **CANCEL** command to close itself down immediately.

The SET command options

You can use the SET command to modify groups of server initialization parameters.

These system initialization parameter groups are:
- The statistics parameters
- The debug trace parameters
- The lock wait parameters
- The warning parameters
- The automatic ALTER parameters.

See “Coupling facility data table server parameters” on page 353 for details of these keywords.

The following **SET** keywords are used to modify the server's recovery status of an inactive CICS region that had unresolved units of work when it last terminated:

RESTARTED=*applid*
: Establish a temporary recoverable connection for the given APPLID. This resolves any units of work that were in commit or backout processing when the region last terminated, and indicates whether there are any remaining indoubt units of work.

  This keyword can be abbreviated to **RESTART** or **REST**.

COMMITTED={*applid*|*applid.uowid*}
Establish a temporary recoverable connection for the specified APPLID and commit all indoubt units of work, or, if *uowid* is also specified, commit that specific unit of work.

This command should be used **only** when it is not possible to restart the original CICS region to resolve the work normally, because it can result in inconsistency between coupling facility data table resources and other CICS resources updated by the same unit of work.

This keyword can be abbreviated to **COMMIT** or **COMM**.

BACKEDOUT={*applid*|*applid.uowid*}
Establish a temporary recoverable connection for the specified APPLID and back out all indoubt units of work, or, if *uowid* is also specified, back out that specific unit of work.

This command should be used *only* when it is not possible to restart the original CICS region to resolve the work normally, because it can result in inconsistency between coupling facility data table resources and other CICS resources updated by the same unit of work.

This keyword can be abbreviated to **BACKOUT** or **BACK**.

Use the following **SET** parameters to modify options relating to a specific table:

TABLE=*name*
specifies the table to which the following table-related parameters in the same command are to be applied. This parameter is required before any table-related parameters.

MAXRECS=*number*
Modify the maximum number of records that can be stored in the table specified by the preceding **TABLE** parameter.

If the maximum number is set to a value less than the current number of records in the table, no new records can be stored until records have been deleted to reduce the current number to within the new maximum limit. For a recoverable table, this also means that records cannot be updated, because the recoverable update process adds a new record on the rewrite operation then deletes the original record when the transaction completes.

This keyword can also be specified as **MAXNUMRECS**.

AVAILABLE={YES|NO}
Specify whether the table named by the preceding **TABLE** parameter is available for new OPEN requests. If the table is made unavailable, a CICS region that subsequently issues an OPEN request for the table receives a response indicating that it is unavailable, but regions that currently have the table open are not affected. Even when a table is marked as unavailable, a server can implicitly open it on behalf of a CICS region to allow recoverable work to be resolved during restart processing.

This keyword can be abbreviated to **AVAIL**.

Examples of the SET command: The following example changes the statistics options:

```
SET STATSOPT=BOTH,EOD=21:00,STATSINT=06:00
```

The following example modifies the maximum number of records allowed in the specified table:

```
SET TABLE=PAYECFT1,MAXRECS=200000
```

DISPLAY and PRINT command options

You can use the DISPLAY (and PRINT) commands to display the values of any initialization parameters plus some additional information.

Some of the parameters that provide additional information support generic names. You specify generic names using the following wildcard characters:

- An * (asterisk symbol). Use this anywhere in the parameter value to represent from 0 to 8 characters of any value. For example, CICSH* to represent all the CICS APPLIDs in a CICSplex identified by the letter H.
- A % (per cent symbol). Use this anywhere in the parameter value to represent only one character of any value. For example, CICS%T* to represent all the TOR APPLIDs in all CICSplexes.

The parameters supported by the DISPLAY and PRINT commands are as follows:

APPLIDS
Display the APPLID and MVS system name for every CICS region that currently has a recoverable connection to the pool. This command returns information not only for the server to which the MODIFY command is issued, but for all other servers connected to the same pool.

This keyword can be abbreviated to **APPLID**, **APPLS** or **APPL**.

APPLID={*applid*|*generic*}
Display the APPLID and MVS system name for each region that currently has a recoverable connection to the server's pool, and whose APPLID matches *applid* or *generic*. This command returns information not only for the server to which the MODIFY command is issued, but for all other servers connected to the same pool.

applid Use this for a specific APPLID, which should match only one region in the sysplex.

generic Use a suitable generic value when you want to obtain information about several regions.

If *applid* or *generic* is not specified, the server treats this as equivalent to the command DISPLAY APPLIDS.

This keyword can also be specified as **APPLIDS**, **APPLS** or **APPL**.

ARMREGISTERED
Shows whether ARM registration was successful (YES or NO).

CONNECTIONS
Display the jobnames and applids of the regions currently connected to the server to which the command is issued.

This keyword can be abbreviated to **CONN**.

TABLES
Display the names of all tables currently allocated in the pool.

TABLE={*name*|*generic_name*}
Display information about the attributes and status of a specific table, or of a set of tables whose names match the generic name.

If no table name is specified, this is treated as equivalent to DISPLAY TABLES.

TABLEUSERS
Display the CICS APPLIDs of the regions that are currently using each of the tables currently defined in the pool.

This keyword can be abbreviated to **TABLEU**.

TABLEUSERS={*name*|*generic_name*}
Display the CICS APPLIDs of the regions that are currently using the specified table, or using each of the set of tables whose names match the generic name.

If no table name is specified, this is treated as equivalent to DISPLAY TABLEUSERS.

This keyword can be abbreviated to **TABLEU**

UOWIDS
Display the applids of all regions that currently have unresolved recoverable units of work, together with the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

This keyword can be abbreviated to **UOWS**.

UOWIDS={*applid*|*generic_applid*}v{*applid*.*|*generic_applid*.*}
Display, for the specified regions if they currently have unresolved recoverable units of work, information about those units of work. The information returned depends on the form of operand used.

applid|*generic_applid*
This form of operand displays the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

If you specify *applid*, the server displays UOW information for a specific APPLID, which should correspond to only one region in the sysplex.

If you specify *generic_applid* the server displays UOW information for all the APPLIDs that match the generic APPLID specified.

applid.*|*generic_applid*.*
This form of operand displays:

- The state and local UOWID of each individual unit of work, followed by
- A summary of the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

If you specify *applid*.*, the server displays the UOW information for a specific APPLID, which should correspond to only one region in the sysplex.

If you specify *generic_applid*.*, the server displays UOW information for all the APPLIDs that match the generic APPLID specified.

This keyword can be abbreviated to **UOWS**.

UOWID=*applid.uowid*
Display the state of an individual unresolved unit of work, identified by its applid and local unit of work ID (UOWID). Enter the local UOWID as 16 hexadecimal digits.

This keyword can be abbreviated to **UOW**.

DISPLAY and PRINT options for statistics summaries

Use the following parameters to display or print statistics:

CFSTATS
Display statistics for coupling facility interface accesses and responses from the server.

This keyword can also be specified as **CFST** or **STATSCF**.

POOLSTATS
Display usage statistics for the pool list structure as a whole. This is based on information returned by coupling facility access requests, therefore it is only as current as the most recent request made through the server to which the command is issued.

This keyword can be abbreviated to **POOLST**.

TABLESTATS
Display statistics for requests, processed by the server to which the command is issued, for each table plus a summary of all requests processed, including those that are not table-specific, such as unit of work control.

Note that only tables with a non-zero number of requests since the start of the current statistics interval are shown.

This keyword can also be specified as **TABLEST**.

TABLESTATS={*name*|*generic_name*}
Display request statistics for the specified table or tables.

name A specific table name in the pool accessed by the server. Returns statistics for this table only.

generic_name
A generic name that you can use to obtain statistics about a number of tables. Returns statistics for any table name that matches the generic name.

This keyword can be abbreviated to **TABLEST**.

STORAGESTATS
Display main storage allocation statistics for the server address space.

This keyword can be abbreviated to **STORAGEST** or **STGST**.

DISPLAY and PRINT options for combined lists of information

These keywords represent combined lists of information:

PARAMETERS
Display the main parameter values. These are POOLNAME, SECURITY, SECURITYPREFIX, statistics options, and list structure options.

This keyword can be abbreviated to **PARM** or **PARMS**.

ALLPARAMETERS
Display all parameter values.

This keyword can be abbreviated to **ALLPARMS**.

STATISTICS
Display all available statistics.

This keyword can be abbreviated to **STAT** or **STATS**.

INITIALIZED
Display the parameters and statistics that are usually displayed when initialization is complete. This is equivalent to PARM, POOLSTATS, STGSTATS.

This keyword can be abbreviated to **INIT**.

ARM

Display all ARM-related parameter values:

- ARMELEMENTNAME
- ARMELEMENTTYPE
- ARMREGISTERED

This keyword can be coded as **ARMSTATUS**.

The CANCEL command options

You can use the CANCEL command to request an automatic restart.

Specify the following parameter:

RESTART={NO∨YES}

Terminate the server immediately, specifying whether or not automatic restart should be requested. The default is RESTART=NO.

If the server encounters an unrecoverable problem with the coupling facility connection, consisting either of lost connectivity or a structure failure, it cancels itself using the CANCEL RESTART=YES command. This terminates the existing connection and shuts down the server. A new instance of the server job is then started.

A server can also be restarted explicitly using either the server command CANCEL RESTART=YES or the MVS command CANCEL jobname,ARMRESTART.

You can also enter RESTART on its own for RESTART=YES, NORESTART for RESTART=NO.

Deleting or emptying coupling facility data table pools

You can delete a coupling facility data table pool using the MVS **SETXCF** command to delete its coupling facility list structure.

About this task

For example:

```
SETXCF FORCE,STRUCTURE,STRNAME=DFHCFLS_poolname
```

You can delete a structure only when there are no servers connected to the pool, otherwise MVS rejects the command.

When you attempt to start a server for a pool that has been deleted (or attempt to reload the pool), it is allocated as a new structure. The newly allocated structure uses size and location attributes specified by the currently active CFRM policy, and other values determined by the server initialization parameters (in particular, **MAXTABLES**).

Unloading and reloading coupling facility data table pools

You can unload, and reload, the complete contents of a coupling facility data table pool to and from a sequential data set by invoking the server program with the **FUNCTION** parameter, using the UNLOAD and RELOAD options.

About this task

You can use this function, for example, to do the following:

- Preserve the coupling facility data table pool during planned coupling facility maintenance, or
- Move the pool to a different coupling facility.
- Increase the size of the pool's list structure.

  If the maximum number of tables specified in the original pool was too small, or the pool has reached its maximum size and needs to be expanded further, unload the pool, then delete the structure so that the reload process can reallocate it with more space.

Alternatively, you can use the system-managed rebuild facility to dynamically move a structure to another coupling facility connected to the same system. This allows servers to remain active, but temporarily suspends processing while the rebuild is in progress. For more information, see "System-managed list structure rebuild" on page 411.

FUNCTION={UNLOAD|RELOAD}
Specify the function for which the server is being initialized.

UNLOAD
Unload the entire contents of the coupling facility data table pool specified on the POOLNAME parameter to a sequential data set. When the unload processing has completed (normally or abnormally) the server program terminates.

The UNLOAD function requires a DD statement for DDNAME DFHCFUL describing the sequential data set to which the table pool is to be unloaded. The format of the unloaded data set is:

RECFM=F
LRECL=4096
BLKSIZE=4096

You can obtain an estimate of the upper limit for the total size of the data set, in bytes, from the pool usage statistics produced by the server:

- From the statistics, multiply the number of elements in use by the element size (usually 256) to get a total number of bytes for the data size, although the space needed to unload the data is normally much less, because unused space in a data element is not unloaded.
- Add some space for the record keys, calculated using a two-byte prefix plus the keylength for each record, plus about 100 bytes per table for table control information. Thus, the maximum you should need for keys and control information is:

```
(18 bytes x number of entries) + (100 bytes x number of tables)
```

RELOAD
Reload, into the coupling facility data table pool named on the POOLNAME parameter, a previously unloaded coupling facility data table pool.

You can reload a pool into a pool with a different name—it does not have to keep the same name as the original pool. When the reload processing has completed (normally or abnormally) the server program terminates.

The RELOAD function requires a DD statement for DDNAME DFHCFRL, describing the sequential data set from which the table pool is to be reloaded.

The structure is allocated, if necessary, during reloading, in which case you can use the same server parameters to control structure attributes as for normal server startup. The reload process bypasses any tables or units of work that are already found in the pool (for example, because the structure was too small and the reload job had to be restarted after using ALTER to increase the structure size).

Note: If the unloaded pool structure was altered dynamically at any time after initial allocation (by using the SETXCF command to increase the size), ensure that the increased size is allocated for the reloaded pool. The recommended way is to update the INITSIZE parameter for the structure in the current CFRM policy whenever you alter the structure size, and to activate the updated policy using the SETXCF START ,POLICY command. Alternatively, you can specify the required pool size in the POOLSIZE parameter in the reload JCL, but note that this does not override the CFRM INITSIZE parameter if it is exactly equal to the maximum pool size.

Note: If you omit the FUNCTION parameter, the server program initializes a coupling facility data table server address space.

For the UNLOAD and RELOAD function, the server program requires exclusive use of the list structure. If the structure is currently being used by a normal server, the unload or reload attempt is rejected. Similarly, if a normal server attempts to start up while an unload or reload job is in progress, the attempt fails because shared access to the structure is not available.

You can specify all normal server parameters when unloading or reloading, but some of these (for example, security-related parameters) are ignored because they do not apply to unload or reload processing.

Note that when a pool is nearly full (with less than about 5% free entries and elements) there is no guarantee that it can be unloaded and reloaded into a structure of exactly the same size. This is because the amount of space available is affected by the current ratio of entries to elements, which is controlled only approximately by the automatic ALTER process.If the structure reaches the warning level during reloading, the automatic ALTER process attempts to adjust the entry to element ratio. The reload process automatically waits for the ALTER to complete if reloading runs out of space while an ALTER is still in progress.

If reloading fails because it runs out of space, the resulting messages include the numbers of tables reloaded and blocks read up to the time of the failure. You can compare these values with those in the messages from the original unload job, to determine how many more tables and how much more data remains to be loaded. If a table had been partially reloaded before running out of space, it is deleted so that the whole table is reloaded again if the reload is retried later. If reloading is interrupted for any other reason than running out of space, for example by an MVS system failure, reloading can still be restarted using the partially reloaded structure, but in that case the structure space occupied by any partially reloaded table will be unavailable, so it is normally better to delete the structure (using the MVS **SETXCF FORCE** command) and start reloading again with a newly allocated structure.

```
//UNLDCFD1 JOB  ...
//DTUNLOAD EXEC PGM=DFHCFMN        CICS CF data table server program
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR  Authorized library
//SYSPRINT DD   SYSOUT=*           Options, messages and statistics
//DFHCFUL  DD   DSN=CFDT1.UNLOADED.POOL,  Unloaded data table pool
//         DISP=(NEW,CATLG),
//         SPACE=(4096,(10000,1000))  Estimated size in 4K blocks
//SYSIN    DD   *
FUNCTION=UNLOAD                   Function to be performed is UNLOAD
POOLNAME=PRODCFD1                 Pool name
/*
```

Figure 35. Unload JCL example

```
//RELDCFD1 JOB  ...
//DTRELOAD EXEC PGM=DFHCFMN        CICS CF data table server program
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR  Authorized library
//SYSPRINT DD   SYSOUT=*           Options, messages and statistics
//DFHCFRL  DD   DSN=CFDT1.UNLOADED.POOL,DISP=OLD  Unloaded table pool
//SYSIN    DD   *
FUNCTION=RELOAD                   Function to be performed is RELOAD
POOLNAME=PRODCFD1                 Pool name
POOLSIZE=50M                      Increased pool size
MAXTABLES=500                     Increased max number of tables
/*
```

Figure 36. Reload JCL example

Chapter 23. Setting up and running a region status server

You can use a CICS region status server to share CICS region status data in a sysplex rapidly to support optimized workload management. A region status server services only region status requests, rather than region status and user application requests.

About this task

CICS region status data is broadcast to the sysplex using a data table named after the hosting CICSplex for the region. Each region in the CICSplex is described by a single record in the CICSplex data table. The data tables are held in coupling facility structures, with access controlled by a coupling facility data table (CFDT) server. You must set up one CFDT server for each pool in an MVS image.

You can use a CICS region status server to share CICS region status data in a sysplex rapidly to support optimized workload management. A region status server services only region status requests, rather than region status and user application requests.

Note: You must use different pool names for your region status server if you have two separate CICSplexes of the same name in the sysplex.

To set up and manage a region status server, follow these steps:

Procedure

1. Optional: For the best performance, define a list structure for a region status server pool. For more information, see "Defining a list structure for a region status server" on page 374.

   This step is optional if you have an existing CFDT pool that you can use to store your CICSplex data tables. However, the throughput of your optimized workloads might be impeded by any user application activity to the specified pool name, and any application throughput to the pool might be affected by the sysplex optimized workloads.

   Note: You must use a different pool name from the pool name that you use for the RS server if you already have a CFDT with the same name as your CICSplex.
2. Define and start a region status server job, to run in an MVS batch region. For more information, see "Defining and starting a region status server region" on page 375.

What to do next

After you have successfully started your region status server, you can issue commands to manage the region status server and delete it if required. For more information, see "Controlling region status servers" on page 376 and "Deleting region status server pools" on page 382.

Related information:

Optimized dynamic workload routing implementation

Security for coupling facility data tables in the RACF Security Guide

Defining a list structure for a region status server

The region status server pool is defined in the list structure for a coupling facility data table. You define the list structure in a coupling facility resource manager (CFRM) policy.

About this task

You must allocate storage in the coupling facility to store CICS status.

CICS records the status of a CICS region in a coupling facility data table named after the CICSplex to which the region belongs. That table must belong to a CFDT pool that is named in the CICSplex definition for that CICSplex. The default name is DFHRSTAT. In each z/OS image, there must be a region status server for each region status pool that will serve the CICS regions belonging to that CICSplex. A CICSplex data table contains one region status record for each region in that CICSplex.

Define the structure in the current coupling facility resource management (CFRM) policy using the IXCMIAPU utility. For an example of this utility, see member IXCCFRMP in the SYS1.SAMPLIB library. An example of a policy statement for a region status server pool is shown Figure 37 on page 375.

Procedure

1. Specify the name of the list structure. The name is formed by adding the prefix DFHCFLS_ to your chosen pool name, giving DFHCFLS_*poolname*. The default pool name as implemented by CPSM is DFHRSTAT.

   You define and modify CICSplexes using the EYUSTARTCPLEXDEF view set. Using the CPLEXDEF detail view, you can modify the coupling facility (CF) tuning parameters for the region status (RS) server, which provide sysplex optimized workload routing.

   Note: You can also modify the default region status (RS) pool name that will be used by all regions in the CICSplex. When you do not to use the default name DFHRSTAT, you must change the name before starting any other regions in the CICSplex. CPSM will not prevent you from changing the pool name while the CICSplex is active. If you make a change while the CICSplex is active, all CMAS and MAS regions in the CICSplex must be restarted as soon as possible. Failure to do so can result in inconsistent data in the CPSM WLM views and WLM optimization is deactivated until all the regions in the CICSplex are restarted.
2. Specify the size of the list structure. You can allocate an initial and maximum size using the **INITSIZE** and **SIZE** parameters in the CRFM policy definition. For an accurate estimate of storage requirements, use the IBM CFSizer tool available at http://www.ibm.com/systems/support/z/cfsizer/.

   A region status record is approximately 40 bytes long.

   For example, if PLEX1 contains 100 regions, PLEX2 contains 300 regions, and PLEX3 contains 1000 regions, the required structures are as follows:

   - Poolname = DFHRSTAT, Table name = PLEX1, 100 regions x 40 bytes = 4 000 bytes total

- Poolname = DFHRSTAT, Table name = PLEX2, 300 regions x 40 bytes = 12 000 bytes total
- Poolname = DFHRSTAT, Table name = PLEX3, 1000 regions x 40 bytes = 40 000 bytes total

3. Specify the preference list of coupling facilities in which the policy can be stored.
4. When you have updated the CFRM new policy with the new structure definition, activate the policy using the MVS command:

   `SETXCF START,POLICY,POLNAME=`*`policyname`*`,TYPE=CFRM. Where policyname is the CFRM policy being st`

   Note that defining the CFRM policy statements for a list structure does not create the list structure. The structure is created the first time an attempt is made to connect to it, which occurs when the first coupling facility data table (CFDT) server that refers to the corresponding pool is started.

Example

```

 STRUCTURE  NAME(DFHCFLS_DFHRSTAT)
    SIZE(1000)
    INITSIZE(500)
    PREFLIST(FACIL01,FACIL02)

```

Figure 37. Example definition of a list structure for region status servers

Defining and starting a region status server region

When you start a region status server, you activate a pool in an MVS image for that server.

Before you begin

Before you start a region status server region, you must define the region status server structure to be used for the pool. For information about defining a region status server list structure, see “Defining a list structure for a region status server” on page 374.

About this task

You can start the server as a started task, started job, or as a batch job. This task explains how to start a region status server job, to run in an MVS batch region. The job or task must start the region status server program, DFHCFMN, from the CICS authorized library, CICSTS42.CICS.SDFHAUTH.

Procedure

1. Specify the DFHCFMN program either in a SYSIN data set defined in the JCL, or in the **PARM** parameter on the EXEC statement.
2. Specify the mandatory and optional startup parameters for the DFHCFMN program. If you specify a startup parameter in both the SYSIN data set and the **PARM** parameter, the **PARM** value overrides the SYSIN value because the **MVS START** command can override the **PARM** value.
   a. You must specify a SYSPRINT DD statement for the print file.
   b. You must specify a SYSIN DD statement for the server parameters.

Tip: To ensure that all pool-related parameters are consistent across MVS images, you must use the same SYSIN parameter data set, or an identical copy of it, for all servers accessing the same pool, and to specify in the PARM field any parameters that vary between servers.

c. You must specify the region status pool name.

d. You can specify the **REGION** parameter. This parameter ensures that the coupling facility data table server region has enough storage to process the maximum number of data table requests that can run concurrently.

e. You can specify **TIME=NOLIMIT**. The server task remains in a wait, during most normal processing, because server processing is performed under the TCB of the client CICS region. If you omit this parameter, your server job might fail with abend S522 (wait limit exceeded), depending on the JWT value specified in the SMFPRM*xx* member of SYS1.PARMLIB.

f. Specify additional parameters as required. For example, you might want to control the maximum number of queues that are to be supported in the pool and the number of buffers that the server is to allocate.

Results

The region status server is running, ready to receive and broadcast region status data to the CICS regions connected to it. The CICS regions connect through the poolname specified in the CICSplex definition.

Region status server JCL example

```
//PRODRSS1 JOB  ...
//RSSERVER EXEC PGM=DFHCFMN,REGION=40M,TIME=NOLIMIT    CICS CFDT Server for RS
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR    Authorized library
//SYSPRINT DD   SYSOUT=*                               Messages and statistics
//SYSIN    DD   *
POOLNAME=DFHRSTAT                                      Pool name
MAXTABLES=100                                          Allow up to 100 tables
/*
```

Figure 38. Sample JCL to start a region status server address space

Controlling region status servers

You can issue commands to control a region status server, using the MVS **MODIFY (F)** command to specify the job or started task name of the server region, followed by the server command.

About this task

The general form of an MVS modify command, using the short form F, is as follows:

```
F job_name,command parameters... comments
```

You use the MODIFY command to pass information to a job or started task. In this task, you use the following commands to control the region status servers.

Procedure

- To modify the server initialization parameters, use the MVS **SET** command:

  ```
  SET keyword=operand[,keyword=operand,...]
  ```

The **SET** command can be abbreviated to **T**, as for the MVS **SET** command. See "The SET command options" on page 364 for details.

- To display the values of one or more parameter values or statistics summary information on the console, use the **DISPLAY** command:

  ```
  DISPLAY keyword[=operand][,keyword[=operand,]...]
  ```

  The valid keywords for **DISPLAY** are all the initialization parameters, plus an additional set described under "DISPLAY and PRINT command options" on page 366.

  The **DISPLAY** command can be abbreviated to **D**, as for the MVS **DISPLAY** command.
- To print the output that the **DISPLAY** command produces, use the MVS **PRINT** command:

  ```
  PRINT keyword[=operand][,keyword[=operand,]...]
  ```

  The **PRINT** command produces the same output as DISPLAY, supporting the same keywords, but on the print file only.
- To delete a table, use the **DELETE TABLE**=*name* command. The table must not be in use for this command to succeed. You can abbreviate the command to **DEL**.
- To stop the server normally, use the **STOP** command. The server waits for any active connections to end first, and prevents any new connections while it is waiting. You can abbreviate the command to **P**. You can also use the **MVS STOP** command, which is equivalent to issuing the server STOP command through the **MVS MODIFY** command. The syntax of the **STOP** command is:

  ```
  STOP|P [jobname.]identifier[,A=asid]
  ```
- To terminate the server immediately, use the **CANCEL** command. You can also specify whether the server automatically restarts with the RESTART option. For information about CANCEL RESTART see "The CANCEL command options" on page 341.
- The server also responds to Cross System Extended Services (XES) events such as an operator **SETXCF** command to alter the structure size. If the server can no longer access the coupling facility, it automatically issues a server **CANCEL** command to close itself down immediately.

The SET command options

You can use the SET command to modify groups of server initialization parameters.

These system initialization parameter groups are:
- The statistics parameters
- The debug trace parameters
- The lock wait parameters
- The warning parameters
- The automatic ALTER parameters.

See "Coupling facility data table server parameters" on page 353 for details of these keywords.

The following **SET** keywords are used to modify the server's recovery status of an inactive CICS region that had unresolved units of work when it last terminated:

RESTARTED=*applid*
Establish a temporary recoverable connection for the given APPLID. This resolves any units of work that were in commit or backout processing when the region last terminated, and indicates whether there are any remaining indoubt units of work.

This keyword can be abbreviated to **RESTART** or **REST**.

COMMITTED={*applid***|***applid.uowid***}**
Establish a temporary recoverable connection for the specified APPLID and commit all indoubt units of work, or, if *uowid* is also specified, commit that specific unit of work.

This command should be used **only** when it is not possible to restart the original CICS region to resolve the work normally, because it can result in inconsistency between coupling facility data table resources and other CICS resources updated by the same unit of work.

This keyword can be abbreviated to **COMMIT** or **COMM**.

BACKEDOUT={*applid***|***applid.uowid***}**
Establish a temporary recoverable connection for the specified APPLID and back out all indoubt units of work, or, if *uowid* is also specified, back out that specific unit of work.

This command should be used *only* when it is not possible to restart the original CICS region to resolve the work normally, because it can result in inconsistency between coupling facility data table resources and other CICS resources updated by the same unit of work.

This keyword can be abbreviated to **BACKOUT** or **BACK**.

Use the following **SET** parameters to modify options relating to a specific table:

TABLE=*name*
specifies the table to which the following table-related parameters in the same command are to be applied. This parameter is required before any table-related parameters.

MAXRECS=*number*
Modify the maximum number of records that can be stored in the table specified by the preceding **TABLE** parameter.

If the maximum number is set to a value less than the current number of records in the table, no new records can be stored until records have been deleted to reduce the current number to within the new maximum limit. For a recoverable table, this also means that records cannot be updated, because the recoverable update process adds a new record on the rewrite operation then deletes the original record when the transaction completes.

This keyword can also be specified as **MAXNUMRECS**.

AVAILABLE={YES|NO}
Specify whether the table named by the preceding **TABLE** parameter is available for new OPEN requests. If the table is made unavailable, a CICS region that subsequently issues an OPEN request for the table receives a response indicating that it is unavailable, but regions that currently have the table open are not affected. Even when a table is marked as unavailable, a server can implicitly open it on behalf of a CICS region to allow recoverable work to be resolved during restart processing.

This keyword can be abbreviated to **AVAIL**.

Examples of the SET command: The following example changes the statistics options:

```
SET STATSOPT=BOTH,EOD=21:00,STATSINT=06:00
```

The following example modifies the maximum number of records allowed in the specified table:

```
SET TABLE=PAYECFT1,MAXRECS=200000
```

DISPLAY and PRINT command options

You can use the DISPLAY (and PRINT) commands to display the values of any initialization parameters plus some additional information.

Some of the parameters that provide additional information support generic names. You specify generic names using the following wildcard characters:

- An * (asterisk symbol). Use this anywhere in the parameter value to represent from 0 to 8 characters of any value. For example, CICSH* to represent all the CICS APPLIDs in a CICSplex identified by the letter H.
- A % (per cent symbol). Use this anywhere in the parameter value to represent only one character of any value. For example, CICS%T* to represent all the TOR APPLIDs in all CICSplexes.

The parameters supported by the DISPLAY and PRINT commands are as follows:

`APPLIDS`

Display the APPLID and MVS system name for every CICS region that currently has a recoverable connection to the pool. This command returns information not only for the server to which the MODIFY command is issued, but for all other servers connected to the same pool.

This keyword can be abbreviated to **APPLID**, **APPLS** or **APPL**.

`APPLID={`*`applid`*`|`*`generic`*`}`

Display the APPLID and MVS system name for each region that currently has a recoverable connection to the server's pool, and whose APPLID matches *applid* or *generic*. This command returns information not only for the server to which the MODIFY command is issued, but for all other servers connected to the same pool.

applid Use this for a specific APPLID, which should match only one region in the sysplex.

generic Use a suitable generic value when you want to obtain information about several regions.

If *applid* or *generic* is not specified, the server treats this as equivalent to the command DISPLAY APPLIDS.

This keyword can also be specified as **APPLIDS**, **APPLS** or **APPL**.

`ARMREGISTERED`

Shows whether ARM registration was successful (YES or NO).

`CONNECTIONS`

Display the jobnames and applids of the regions currently connected to the server to which the command is issued.

This keyword can be abbreviated to **CONN**.

`TABLES`

Display the names of all tables currently allocated in the pool.

TABLE={*name*|*generic_name*}
Display information about the attributes and status of a specific table, or of a set of tables whose names match the generic name.

If no table name is specified, this is treated as equivalent to DISPLAY TABLES.

TABLEUSERS
Display the CICS APPLIDs of the regions that are currently using each of the tables currently defined in the pool.

This keyword can be abbreviated to **TABLEU**.

TABLEUSERS={*name*|*generic_name*}
Display the CICS APPLIDs of the regions that are currently using the specified table, or using each of the set of tables whose names match the generic name.

If no table name is specified, this is treated as equivalent to DISPLAY TABLEUSERS.

This keyword can be abbreviated to **TABLEU**

UOWIDS
Display the applids of all regions that currently have unresolved recoverable units of work, together with the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

This keyword can be abbreviated to **UOWS**.

UOWIDS={*applid*|*generic_applid*}v**{*applid*.*|*generic_applid*.*}**
Display, for the specified regions if they currently have unresolved recoverable units of work, information about those units of work. The information returned depends on the form of operand used.

applid|*generic_applid*
This form of operand displays the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

If you specify *applid*, the server displays UOW information for a specific APPLID, which should correspond to only one region in the sysplex.

If you specify *generic_applid* the server displays UOW information for all the APPLIDs that match the generic APPLID specified.

applid.*|*generic_applid*.*
This form of operand displays:

- The state and local UOWID of each individual unit of work, followed by
- A summary of the number of units of work that are currently in doubt, or are in the process of being committed or backed out.

If you specify *applid*.*, the server displays the UOW information for a specific APPLID, which should correspond to only one region in the sysplex.

If you specify *generic_applid*.*, the server displays UOW information for all the APPLIDs that match the generic APPLID specified.

This keyword can be abbreviated to **UOWS**.

UOWID=*applid.uowid*
Display the state of an individual unresolved unit of work, identified by its applid and local unit of work ID (UOWID). Enter the local UOWID as 16 hexadecimal digits.

This keyword can be abbreviated to **UOW**.

DISPLAY and PRINT options for statistics summaries

Use the following parameters to display or print statistics:

CFSTATS
Display statistics for coupling facility interface accesses and responses from the server.

This keyword can also be specified as **CFST** or **STATSCF**.

POOLSTATS
Display usage statistics for the pool list structure as a whole. This is based on information returned by coupling facility access requests, therefore it is only as current as the most recent request made through the server to which the command is issued.

This keyword can be abbreviated to **POOLST**.

TABLESTATS
Display statistics for requests, processed by the server to which the command is issued, for each table plus a summary of all requests processed, including those that are not table-specific, such as unit of work control.

Note that only tables with a non-zero number of requests since the start of the current statistics interval are shown.

This keyword can also be specified as **TABLEST**.

TABLESTATS={*name***|***generic_name***}**
Display request statistics for the specified table or tables.

name A specific table name in the pool accessed by the server. Returns statistics for this table only.

generic_name
A generic name that you can use to obtain statistics about a number of tables. Returns statistics for any table name that matches the generic name.

This keyword can be abbreviated to **TABLEST**.

STORAGESTATS
Display main storage allocation statistics for the server address space.

This keyword can be abbreviated to **STORAGEST** or **STGST**.

DISPLAY and PRINT options for combined lists of information

These keywords represent combined lists of information:

PARAMETERS
Display the main parameter values. These are POOLNAME, SECURITY, SECURITYPREFIX, statistics options, and list structure options.

This keyword can be abbreviated to **PARM** or **PARMS**.

ALLPARAMETERS
Display all parameter values.

This keyword can be abbreviated to **ALLPARMS**.

STATISTICS
Display all available statistics.

This keyword can be abbreviated to **STAT** or **STATS**.

INITIALIZED
Display the parameters and statistics that are usually displayed when initialization is complete. This is equivalent to PARM, POOLSTATS, STGSTATS.

This keyword can be abbreviated to **INIT**.

ARM
Display all ARM-related parameter values:

- ARMELEMENTNAME
- ARMELEMENTTYPE
- ARMREGISTERED

This keyword can be coded as **ARMSTATUS**.

The CANCEL command options

You can use the CANCEL command to request an automatic restart.

Specify the following parameter:

RESTART={NO∨YES}
Terminate the server immediately, specifying whether or not automatic restart should be requested. The default is RESTART=NO.

If the server encounters an unrecoverable problem with the coupling facility connection, consisting either of lost connectivity or a structure failure, it cancels itself using the CANCEL RESTART=YES command. This terminates the existing connection and shuts down the server. A new instance of the server job is then started.

A server can also be restarted explicitly using either the server command CANCEL RESTART=YES or the MVS command CANCEL jobname,ARMRESTART.

You can also enter RESTART on its own for RESTART=YES, NORESTART for RESTART=NO.

Deleting region status server pools

You can delete a region status server pool by deleting its coupling facility list structure. You might do this for a service upgrade, or when a clean sysplex restart is required.

Before you begin

You can delete a structure only when no servers are connected to the pool; otherwise, MVS rejects the command.

About this task

For example:

```
SETXCF FORCE,STRUCTURE,STRNAME=DFHCFLS_poolname
```

You can verify that the pool has been successfully deleted by issuing the XCF command shown here:

```
D XCF STRUCTURE,STRNAME=DFHCFLS_poolname
```

Note that if you delete a region status server structure while CICS regions and workload are running, you disable CICSPlex SM WLM optimized functions.

What to do next

When you attempt to start a server for a pool that has been deleted (or attempt to reload the pool), it is allocated as a new structure. The newly allocated structure uses size and location attributes specified by the currently active CFRM policy and other values determined by the server initialization parameters (in particular, **MAXTABLES**).

Chapter 24. Setting up and running a named counter server

CICS provides an efficient way to generate unique sequence numbers for use by applications in a Parallel Sysplex environment; for example, to allocate a unique number for orders or invoices. A named counter server maintains each sequence of numbers as a named counter.

About this task

The following procedure outlines the steps to set up and manage a named counter server. Details for each step are in the topics that follow.

Procedure

1. Define a named counter options table.
2. Define a list structure.
3. Define and start a named counter server job, to run in an mvs batch region.
4. Manage named counter server regions.
   - Issue commands to control a named counter server.
   - Change the size of named counter pools.
   - Delete or empty named counter pools.
   - Unload and reload named counter pools.
   - Dump named counter pool list structures.

Named counter server overview

Each time a number is assigned, the corresponding named counter is automatically incremented so that the next request gets the next number in sequence. Named counters are the Sysplex equivalent of COUNTER in the Common System Area (CSA) of a single region CICS system.

A named counter server provides a full set of functions to define and use named counters. Each named counter consists of:

- A 16-byte name
- A current value
- A minimum value
- A maximum value.

The values are internally stored as 8-byte (double word) binary numbers, but the user interface allows them to be treated as any length from 1 to 8 bytes, typically 4 bytes.

Named counters are stored in a pool of named counters, where each pool is a small coupling facility list structure, with keys but no data. The pool name forms part of the list structure name. Each named counter is stored as a list structure entry keyed on the specified name, and each request for the next value requires only a single coupling facility access.

Warning: The counters are lost if the coupling facility fails. See the *Application Programming Guide* for details of recovery techniques.

Named counter structures and servers

Within each MVS image, there must be one named counter server for each named counter pool accessed by CICS regions and batch jobs in the MVS image.

Named counter pools are defined as a list structure in the coupling facility resource management (CFRM) policy. The pool name, which is used to form the server name with the prefix DFHNC, is specified in the startup JCL for the server.

Figure 39 illustrates a parallel sysplex with three CICS AORs linked to named counter servers.

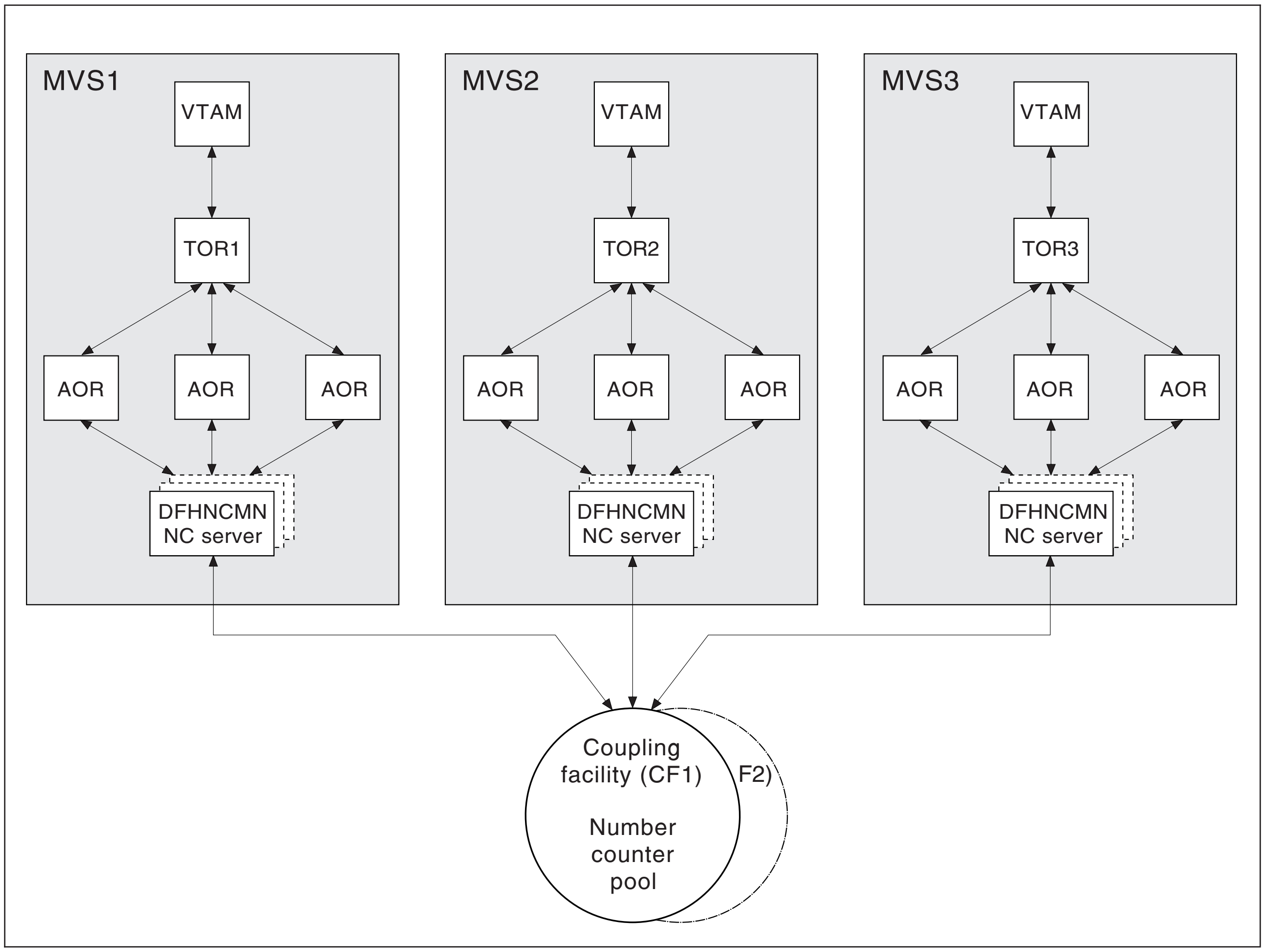


Figure 39. Conceptual view of a parallel sysplex with named counter servers

Application program access to named counters

CICS provides a command level API for the named counter facility. To reference a named counter, an application program can specify either the actual name of the pool in which the named counter is stored, or it can specify a dummy pool selection parameter. The dummy pool value is mapped to the actual pool name by the **POOL** parameter that is specified in the options table, DFHNCOPT.

Specifying a dummy pool makes it easy to use a different pool (for example, to isolate test pools from production pools) without having to change the pool selection parameter in the application program.

To vary the pool used by a CICS region, either load a different copy of the options table from STEPLIB, or use a common options table where the pool name selection is conditional on the job name and CICS APPLID, in addition to the pool name selection parameter. The options table also supports invocation of a user-specified program to select the appropriate pool given the pool selection parameter.

Security

The server must be authorized to access the coupling facility list structure in which the named counter pool is defined. The server must also be authorized to act as a named counter server.

For information on how to define the necessary authorizations see the *CICS RACF Security Guide*.

Note: You cannot control access to individual named counters.

Defining a named counter options table

The named counter callable interface determines the actual pool name in response to a DFHNCTR call by referring to the DFHNCOPT options table.

About this task

When a pool selector value is encountered for the first time, the pool name is determined via the options table. The name is then saved and used for all subsequent requests for the same pool selector from the same TCB. This continues for the life of the TCB or until the NC_FINISH function is used specifying that pool selector value. CICS supplies a default DFHNCOPT in source form, which you can customize and generate using the DFHNCO macro. A typical use of the options table is to enable production and test regions to use a different counter pool without needing to change the pool name in application programs.

To avoid the need to maintain multiple versions of the options table, you can use table entries to select pools based not only on the pool selection parameter specified on the DFHNCTR call, but also on the job name and APPLID of the CICS region. You can also specify the name of a user exit program to be called to make the pool selection.

Define an options table using one or more invocations of the DFHNCO macro. Each invocation generates an options table entry that defines the pool name or user exit program to be used whenever any selection conditions specified on the entry satisfy an application program request. The first entry automatically generates the table header, including the CSECT statement. Follow the last entry with an END statement specifying the table module entry point, DFHNCOPT.

The options table parameters

The DFHNCOPT options table parameters are illustrated in the following figure.

```
DFHNCO [POOLSEL={(generic_values)|*},]
       [JOBNAME={(generic_values)|*},]
       [APPLID={(generic_values)|*},]
       {POOL={YES|NO|name} | CALL=programname}

        Terminate the last DFHNCO entry with the
        following END statement:

END     DFHNCOPT
```

Figure 40. DFHNCOPT options table

The POOLSEL, JOBNAME, and APPLID parameters specify optional selection conditions to determine whether the entry applies to the current request. You can specify each of these operands as

- A single generic name
- A list of names in parentheses, the list containing two or more generic names, each name separated by a comma.

Each name comprises the characters that can appear on the appropriate parameter, plus the wild-card characters * to match any sequence of zero or more non-blank characters, and % to match any single non-blank character. When multiple generic name are specified, the selection condition is satisfied if any one of them matches. A blank pool selector value can be matched using a null POOLSEL operand, for example POOLSEL= or POOLSEL=().

POOLSEL={(generic1,generic2,...,...)∨* }
: Specifies that this options table entry applies only when the pool selection parameter specified by the application program matches one of the generic names specified on this parameter.

  Specifying POOLSEL=, or POOLSEL=() is the equivalent of specifying 8 blanks.

  If you omit the POOLSEL keyword, it defaults to *.

JOBNAME={(generic1,generic2,...,...)∨* }
: Specifies that this options table entry applies only when the caller's job name matches one of the generic names specified on this parameter.

  If you omit the JOBNAME keyword, it defaults to *.

APPLID={(generic1,generic2,...,...)∨* }
: Specifies that this options table entry applies only when the caller's CICS APPLID matches one of the generic names specified on this parameter.

  If you omit the APPLID keyword, it defaults to *.

POOL={YES∨NO∨*name*}
: Specifies the pool name to be used. This parameter is mutually exclusive with the CALL parameter. The options are:

  YES specifies that the server is to use the pool selection parameter specified by the application program as the actual pool name. An all-blank pool selection parameter means the server is to use the default pool name. For the call interface, the default name is DFHNC001. For the EXEC CICS API, the default name is specified by the NCPLDFT system initialization parameter.

NO specifies that the server is not to use any pool and is to reject the request with an error.

name specifies the actual pool name that the server is to use. If *name* is omitted, this indicates that the default pool is to be used. (For the CALL interface, the default pool is always DFHNC001, but for the EXEC CICS interface you can specify the default pool using the NCPLDFT system initialization parameter.)

CALL=*programname*
specifies the name of a user exit program to be called to determine the actual pool name to be used. This parameter is mutually exclusive with the POOL parameter.

The program named can be link-edited with the options table, which generates a weak external reference (WXTRN), or it can be loaded dynamically the first time it is used. The program is called using standard MVS linkage in AMODE 31, with a standard save area and parameter list pointing to four fields, in the following order:

- The 8-byte actual pool name result field
- The 8-byte pool selection parameter.
- The 8-byte job name
- The 8-byte APPLID if running under CICS, otherwise blanks

The end-of-list bit is set in the last parameter address.

The program should be reentrant and should be linked with RMODE ANY, so that it (and the option table if linked with the program) can be loaded above the line. Temporary working storage can be acquired and released using MVS GETMAIN and FREEMAIN. As this program is only called when a new pool selection value is used, the use of GETMAIN and FREEMAIN should not affect performance.

The exit program cannot use any CICS services. If it is used in a CICS region, it must avoid using any MVS services which could result in a long wait, as it will normally be executed under the CICS quasi-reentrant (QR) TCB.

The user exit program indicates its result by setting one of the following return codes in register 15:

0 Use the pool name that is successfully set, in the first field of the parameter list, by the user exit program.

4 The program cannot determine the pool name on this invocation. Continue options table processing at the next entry, as for the case where selection conditions were not met.

8 Reject the request (as if POOL=NO was specified).

The default options table, supplied in CICSTS42.CICS.SDFHLINK, contains the following entries:

```
DFHNCO   POOLSEL=DFHNC*,POOL=YES
DFHNCO   POOL=
END      DFHNCOPT
```

With the default options table in use, any pool selector parameter that specifies a string beginning with DFHNC is taken to be an actual pool name, indicated by POOL=YES in the table entry. Any other value, including a value of all spaces, is assigned the default pool name, indicated by the POOL= table entry without a POOLSEL parameter.

The source for this default table is supplied in CICSTS42.CICS.SDFHSAMP.

Making an options table available to CICS

To ensure that your CICS region can load the named counter options table, install the link-edited table into a CICS authorized library in STEPLIB. Alternatively you can install the table in a suitable library in the LINK list.

Defining a list structure for a named counter server

Define one or more coupling facility list structures for the named counter facility, where each list structure represents a pool of named counters. Each named counter pool is accessed through a cross-memory server region.

Before you begin

A coupling facility structure contains both stored data and the information needed to manage and access that data, in a similar way to a key-sequenced data set. The amount of internal control information depends on the level of functionality and performance of the coupling facility control code for the current coupling facility level (CFLEVEL), and might increase for a higher CFLEVEL. Ensure that you consider storage requirements for your list structures. For more information, see "Named counter list structure storage" on page 391.

About this task

Define the structure in the current coupling facility resource management (CFRM) policy by using the utility IXCMIAPU. For an example of this utility, see member IXCCFRMP in the SYS1.SAMPLIB library (see the information about the administrative data utility for CFRM policy data in *z/OS MVS Setting Up a Sysplex*).

Procedure

1. Specify the name of the list structure. The name is formed by adding the prefix DFHNCLS_ to your chosen pool name, giving DFHNCLS_*poolname*.
2. Specify the size of the list structure. You can allocate an initial and maximum size using the INITSIZE and SIZE parameters in the CRFM policy definition. For an accurate estimate of storage requirements, use the IBM CFSizer tool. See CFSizer.
3. Specify the preference list of coupling facilities in which the policy can be stored. An example definition of a coupling facility list structure for named counters is as follows:

```
| STRUCTURE  NAME(DFHNCLS_PRODNC1)
|    SIZE(2048)
|    INITSIZE(1024)
|    PREFLIST(FACIL01,FACIL02)
```

4. When you have updated the CFRM new policy with the new structure definition, activate the policy using the following MVS command:

```
SETXCF START,POLICY,POLNAME=policyname,TYPE=CFRM.
```

Results

You have defined the CFRM policy statements for a list structure. This action does not create a list structure. The structure is created the first time an attempt is made to connect to it, which occurs when the first named counter server that refers to the corresponding pool is started.

Before you start the named counter server, ensure that you have defined and started the authorized cross-memory (AXM) server environment (see Chapter 20, “Defining and starting AXM system services,” on page 325).

Named counter list structure storage

You can use the System z Coupling Facility Structure Sizer (CFSizer) tool to calculate storage requirements for named counter list structures in a coupling facility. If you increase or decrease the structure size, consider whether you need to update other parameters.

A coupling facility structure contains both stored data and the information needed to manage and access that data, in a similar way to a key-sequenced data set. The amount of internal control information depends on the level of functionality and performance of the coupling facility control code for the current coupling facility level (CFLEVEL), and might increase for a higher CFLEVEL. For more information, see “Coupling facility storage management” on page 404.

CFSizer is a web-based application that takes these factors into account and communicates with a coupling facility at a current CFLEVEL to calculate storage requirements. See CFSizer.

If you enter the number of counters you require, the CFSizer tool calculates the size of a structure that can contain at least that number of counters. However, for practical operation, some free space must be available so that the structure does not become full, and to avoid warning messages about low space. It is advisable to use no more than approximately 75% of the structure size. Estimate the maximum number of counters that you require, then increase that number by a third to include the free space in the calculation.

| The space required for a named counter pool depends on the number of different
| named counters you need, but the minimum size can be enough for most needs.
| For example, for CFLEVEL 16, a 1 MB structure can hold up to 1000 named
| counters.

| All structure sizes are rounded up to the next storage increment for the coupling
| facility level (CFLEVEL) at allocation time. For example, sizes are rounded up to
| the nearest 1 MB for CFLEVEL 16.

Provided that space is available in the coupling facility, you can use the MVS **SETXCF** command to increase the structure size dynamically from its initial size towards its maximum size, making the new space available immediately to any currently active servers. If too much space is allocated, you can reduce the structure size to free up coupling facility storage for other purposes. However, this could take some time if the coupling facility has to move existing data out of the storage that is being freed. If you alter the size in this way, update the **INITSIZE** parameter in the coupling facility resource management (CFRM) policy to reflect the new size, so that the structure does not revert to its original size if it is subsequently recreated or reloaded.

Defining and starting a named counter server region

You activate a named counter pool in an MVS image by starting up a named counter server region for that pool.

About this task

You can start the server as a started task, started job, or as a batch job. The job or task must invoke the named counter server region program, DFHNCMN, and must run from an APF-authorized library. DFHNCMN is in the CICS authorized library, CICSTS42.CICS.SDFHAUTH.

Procedure

1. Specify the DFHNCMN program either in a SYSIN data set defined in the JCL, or in the **PARM** parameter on the EXEC statement.
2. Specify the mandatory and optional startup parameters for the DFHNCMN program. If you specify a startup parameter in both the SYSIN data set and the **PARM** parameter, the **PARM** value overrides the SYSIN value because the **MVS START** command can override the **PARM** value.
   a. You must specify a SYSPRINT DD statement for the print file.
   b. You must specify a SYSIN DD statement for the server parameters.
   c. You must specify the TS pool name.
   d. It is recommended that you specify the **REGION** parameter. This parameter ensures that the coupling facility data table server region has enough storage to process the maximum number of data table requests that can run concurrently.
   e. It is recommended that you specify TIME=NOLIMIT. The server task remains in a wait during most normal processing, because server processing is performed under the TCB of the client CICS region. If you omit this parameter, your server job could fail with abend S522 (wait limit exceeded), depending on the JWT value specified in the SMFPRM*xx* member of SYS1.PARMLIB.
   f. Specify additional parameters as required. For example, you might want to control the maximum number of queues that are to be supported in the pool and the number of buffers the server is to allocate.

   Tip: A good way to ensure that all pool-related parameters are consistent across MVS images is to use the same SYSIN parameter data set, or an identical copy of it, for all servers accessing the same pool, and to specify any parameters that vary between servers in the PARM field.

Example

```
//MVSnNC1 JOB  ...
//NCSERVER EXEC PGM=DFHNCMN,REGION=32M,TIME=NOLIMIT   named counter server
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR   Authorized library
//SYSPRINT DD   SYSOUT=*                              Messages and statistics
//SYSIN    DD   *
POOLNAME=MVSnNC1                             Pool name
/*
```

Figure 41. Sample JCL to start a named counter server address space

Named counter server parameters

Parameters are specified in the form KEYWORD=*value*, where keywords can optionally be specified in mixed case to improve readability.

If you specify more than one parameter in the PARM field or on the same SYSIN input line, the parameters must be separated by a comma. Any text following one or more spaces is taken as a descriptive comment. Any parameter line which starts with an asterisk or a space is assumed to be a whole line comment.

You can enter some parameter keywords in more than one form, such as in abbreviated or truncated form.

The main parameters are listed on the server print file during startup.

Named counter server REGION parameter

Use the JCL REGION parameter to ensure that the named counter server region has enough storage to process the maximum number of named counter requests that can be executing concurrently.

The named counter server typically uses less than one megabyte of storage above 16 MB but below 2 GB, and less than 20 KB below 16 MB.

During server initialization, the server acquires all the available storage above 16 MB but below 2 GB, as determined by the REGION parameter, then releases 5% of it for use by operating system services. It also acquires 5% of the free storage below 16 MB for use in routines that require 24-bit addressable storage.

After initialization, the server uses AXM page allocation services to manage its storage. Server statistics indicate how much storage is allocated and used in the storage areas above and below 16 MB, which are called AXMPGANY and AXMPGLOW in the statistics.

If a task in the server region or a cross-memory request runs out of storage, this is likely to result in AXM terminating that task or request using a simulated abend with system completion code 80A to indicate a GETMAIN failure. Although the server can usually continue processing other requests in this case, running out of storage in a critical routine can cause the server to terminate. Therefore, it is best to ensure that the REGION size is large enough to eliminate this risk.

Pool name parameter

This parameter, POOLNAME, is always required:

POOLNAME=*name*

specifies the 8-character name of the named counter pool. This is appended by the server to the prefix DFHNC to create its own server name, as in DFHNC.*poolname*, and also to the prefix DFHNCLS_ to create the name of the coupling facility list structure, as in DFHNCLS_*poolname*.

This parameter is valid only at server initialization, and must always be specified.

This keyword can be abbreviated to **POOL**.

Statistics parameters

Use the following parameters to specify server statistics options:

ENDOFDAY={<u>00:00</u>|*hh:mm***}**

specifies the time of day, in hours and minutes, when the server is to collect and reset end-of-day statistics.

Note: If the STATSOPTIONS parameter specifies NONE, the server still writes end-of-day statistics to the print file.

The valid range of times is from 00:00 to 24:00.

This keyword can be abbreviated to **EOD**.

STATSINTERVAL={03:00|*hh:mm*}
specifies the statistics collection interval, in the range 1 minute to 24 hours. This parameter is ignored if the STATSOPTIONS parameter specifies NONE.

The time interval can range from 00:01 to 24:00.

This keyword can be abbreviated to **STATSINT**.

STATSOPTIONS={NONE|SMF|PRINT|BOTH}
specifies whether the server is to produce interval statistics, and the destination for the statistics it produces.

NONE
The server does not produce any interval statistics.

SMF The server produces interval statistics and writes them to the current SMF data set only.

PRINT
The server produces interval statistics and writes them to the server's print file only.

BOTH The server produces interval statistics and writes them to the current SMF data set and to the server's print file.

This keyword can be abbreviated to **STATSOPT**.

Automatic restart manager (ARM) parameters

During server initialization, the server unconditionally registers with ARM except when the server program is invoked with either the UNLOAD or the RELOAD functions. The server will not start if the registration fails.

Use the following parameters to override default processing for the automatic restart manager:

ARMELEMENTNAME=*elementname*
specifies the automatic restart manager element name, up to 16 characters, to identify the server to ARM for automatic restart purposes. The permitted characters for the element name are A to Z 0-9 $ # @ and the underscore symbol (_).

The default identifier is of the form DFHNC*nn_poolname*, where NC represents the server type, *nn* is the &SYSCLONE value for the system (which can be either one or two characters), and *poolname* is the name of the pool served by the server.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMENT** or **ARMELEMNAME**.

ARMELEMENTTYPE=*elementtype*
specifies the automatic restart manager element type, up to 8 characters for use in ARM policies as a means of classifying similar elements. The permitted characters for the element type are A to Z 0-9 $ # and @.

The default element type is SYSCICSS.

This parameter is only valid at server initialization.

This keyword can be abbreviated to **ARMELEMTYPE**.

List structure parameter

The list structure parameter specifies the attribute that is used only for initial allocation of resources when the list structure is created for a named counter pool. Initial allocation occurs the first time a server is started for the named counter pool.

POOLSIZE={0|*number*{K|M|G}}

Specifies the initial amount of coupling facility storage to be allocated for the pool list structure, expressed as kilobytes (*n* K), megabytes (*n* M) or gigabytes (*n* G).

Usually, you can omit this parameter and specify the structure size by using the **INITSIZE** parameter in the coupling facility resource manager (CFRM) policy. However, this parameter can be useful if the structure is reallocated or reloaded but the CFRM policy has not been updated to reflect the required size.

0 The special value 0 means that the server obtains an initial allocation using the parameters specified in the CFRM policy. If the CFRM policy specifies an **INITSIZE** value for the structure, this determines the initial allocation. Otherwise, the CFRM **SIZE** value (the maximum size of the structure) is allocated.

number

A non-zero value specifies an initial amount of storage to be allocated, overriding the **INITSIZE** parameter in the CFRM policy. This value is rounded up by MVS to the next storage increment for the coupling facility level (CFLEVEL). For example, for CFLEVEL 16, the value is rounded up to the nearest 1 MB.

The value must be less than the CFRM **SIZE** parameter, otherwise the value of **POOLSIZE** is ignored and the initial allocation uses the parameters specified in the CFRM policy.

| The valid range is from 0 to 16777215M. However, you must specify a value that is less than the maximum size of a structure in z/OS, otherwise a z/OS error occurs. For example, in z/OS, Version 1 Release 12, the maximum size of a structure is 1048576 MB (1 TB). For more details, see the information about CFRM parameters in *z/OS MVS Setting Up a Sysplex*.

This parameter is valid only at server initialization and is used only when the structure is first allocated.

Debug trace parameters

These parameters are provided only for intensive debug tracing.

Using these options in a production environment could have a significant impact on performance and cause the print file to grow very rapidly, using up spool space.

Trace messages from cross-memory requests can be lost if they are generated faster than the trace print subtask can print them. In this event, the trace only indicates how many messages were lost.

CFTRACE={OFF|ON}

specifies the coupling facility interface debug trace option.

OFF Coupling facility interface debug trace is disabled.

ON Coupling facility interface debug trace produces trace messages on the print file, indicating the main parameters to the coupling facility request interface, and the result from the IXLLIST macro.

This keyword can also be specified as **TRACECF**.

RQTRACE={OFF|ON}
specifies the request debug trace option.

OFF	Request debug trace is disabled.
ON	Request debug trace produces trace messages on the print file, indicating the main parameters on entry to each cross-memory request, and the results on exit.

This keyword can also be specified as **TRACERQ=**.

Warning parameters

Use these parameters to modify the thresholds at which warning messages are issued when the structure becomes nearly full.

ENTRYWARN={80|*number*}
specifies the percentage of list structure entries in use at which warning messages should be first triggered.

The valid range is from 1 to 100 per cent.

ENTRYWARNINC={5|*number*}
specifies the percentage increase (or decrease) of entries in use before the next warning message should be triggered (reduced to 1 when the next increase would otherwise reach 100). After the first warning, additional messages are issued as the number of elements increases and decreases. These messages stop when the number of entries in use has fallen at least this percentage below the initial warning level.

The valid range is from 1 to 100 per cent.

Controlling named counter server regions

You can issue commands to control a named counter server, using the **MVS MODIFY (F)** command to specify the job or started task name of the server region, followed by the server command.

About this task

The general form of a named counter server command, using the short form F, is as follows:

```
F server_job_name,command
parameters...  comments
```

SET *keyword=operand[,keyword=operand,...]*
Change one or more server parameter values.

Procedure

- To change one or more server parameter values, use the **SET** command. You can abbreviate the command to **T**, as for the **MVS SET** command. See “The SET command options” on page 397 for details.
- To display one or more parameter values or statistics summary information on the console, use the **DISPLAY** command. The syntax is as follows:

```
DISPLAY keyword[=operand][,keyword[=operand,]...]
```

The valid keywords for **DISPLAY** are all the initialization parameters, plus an additional set described under "DISPLAY and PRINT command options." You can abbreviate the command to **D**, as for the **MVS DISPLAY** command.

- To print the parameter values, use the **PRINT** command. This command produces the same output as the **DISPLAY** command, supporting the same keywords, but on the print file only.
- To stop the server normally, use the **STOP** command. The server waits for any active connections to end first, and prevents any new connections while it is waiting. You can abbreviate the command to **P**. You can also use the **MVS STOP** command, which is equivalent to issuing the server STOP command through the **MVS MODIFY** command. The syntax of the **STOP** command is:

  `STOP|P [jobname.]identifier[,A=asid]`
- To terminate the server immediately, use the **CANCEL** command. You can also specify whether the server automatically restarts with the RESTART option. For information about CANCEL RESTART see "The CANCEL command options" on page 341.
- The server also responds to XES events such as an operator **SETXCF** command to alter the structure size. If the server can no longer access the coupling facility, it automatically issues a server **CANCEL** command to close itself down immediately.

The SET command options

You can use the **SET** command to modify groups of server initialization parameters.

The groups of server initialization parameters are as follows:

- The statistics parameters
- The debug trace parameters
- The warning parameters

See "Named counter server parameters" on page 392 for details of these keywords.

Examples of the SET command: The following example changes the statistics options:

```
SET STATSOPT=BOTH,EOD=21:00,STATSINT=06:00
```

DISPLAY and PRINT command options

You can use the **DISPLAY** and **PRINT** commands to display the values of any initialization parameters plus some additional information.

The parameters supported by the **DISPLAY** and **PRINT** commands are as follows:

ARMREGISTERED
Shows whether ARM registration was successful (YES or NO).

CONNECTIONS
Display the job names and APPLIDs of the regions currently connected to the server to which the command is issued.

This keyword can be abbreviated to **CONN**.

COUNTERS
Display the names of all the named counters currently allocated in a pool.

COUNTERS={*name*|*generic_name*}
Display the details of a specific named counter, or set of named counters

whose names match the generic name. Generic names are specified using the wildcard characters * (asterisk symbol) and % (per cent symbol).

If no named counter is specified, this is treated as equivalent to DISPLAY COUNTERS.

This keyword can be abbreviated to **COUNTER**.

DISPLAY and PRINT options for statistics summaries

Use the following parameters to display or print statistics:

CFSTATS
Display statistics for coupling facility interface accesses and responses from the server.

This keyword can also be specified as **CFST** or **STATSCF**.

POOLSTATS
Display usage statistics for the pool list structure as a whole. This is based on information returned by coupling facility access requests, therefore it is only as current as the most recent request made through the server to which the command is issued.

This keyword can be abbreviated to **POOLST**.

STORAGESTATS
Display main storage allocation statistics for the server address space.

This keyword can be abbreviated to **STORAGEST** or **STGST**.

DISPLAY and PRINT options for combined lists of information

These keywords represent combined lists of information:

PARAMETERS
Display the main parameter values:

- POOLNAME
- STATSOPT
- ENDOFDAY
- STATSINTERVAL
- POOLSIZE

This keyword can be abbreviated to **PARM** or **PARMS**.

ALLPARAMETERS
Display all parameter values, which are those listed for PARAMETERS, as well as the following:

- CFTRACE
- RQTRACE
- ENTRYWARN
- ENTRYWARNINC

This keyword can be abbreviated to **ALLPARMS**.

STATISTICS
Display all available statistics. This keyword can be abbreviated to **STAT** or **STATS**.

INITIALIZED
: Display the parameters and statistics that are usually displayed when initialization is complete, which are those listed for PARAMETERS, as well as the following:

- POOLSTATS
- STGSTATS

This keyword can be abbreviated to **INIT**.

ARM
: Display all ARM-related parameter values:

- ARMELEMENTNAME
- ARMELEMENTTYPE
- ARMREGISTERED

This keyword can be coded as **ARMSTATUS**.

The CANCEL command options

You can use the CANCEL command to request an automatic restart.

Specify the following parameter:

RESTART={NO∨YES}
: Terminate the server immediately, specifying whether or not automatic restart should be requested. The default is RESTART=NO.

If the server encounters an unrecoverable problem with the coupling facility connection, consisting either of lost connectivity or a structure failure, it cancels itself using the CANCEL RESTART=YES command. This terminates the existing connection and shuts down the server. A new instance of the server job is then started.

A server can also be restarted explicitly using either the server command CANCEL RESTART=YES or the MVS command CANCEL jobname,ARMRESTART.

You can also enter RESTART on its own for RESTART=YES, NORESTART for RESTART=NO.

Deleting or emptying named counter pools

You can delete a named counter pool using the MVS **SETXCF** command to delete its coupling facility list structure.

About this task

For example:

```
SETXCF FORCE,STRUCTURE,STRNAME=DFHNCLS_poolname
```

You can delete a structure only when there are no servers connected to the pool, otherwise MVS rejects the command.

When you attempt to start a server for a pool that has been deleted (or attempt to reload the pool), it is allocated as a new structure. The newly allocated structure uses size and location attributes specified by the currently active CFRM policy.

Changing the size of named counter pools

If the structure is becoming full, and the current pool size is less than the maximum, you can use the `SETXCF START,ALTER` command to increase the pool size.

About this task

For example:

```
SETXCF START,ALTER,STRNAME=DFHNCLS_poolname,SIZE=size
```

SIZE is expressed in kilobytes.

Unloading and reloading named counter pools

You can unload, and reload, the complete contents of a named counter pool to and from a sequential data set by invoking the server program with the **`FUNCTION`** parameter, using the `UNLOAD` and `RELOAD` options.

About this task

You can use this function, for example, to:

- Preserve the named counter pool during planned coupling facility maintenance, or
- Move the pool to a different coupling facility.

`FUNCTION={UNLOAD|RELOAD}`
Specify the function for which the server is being initialized.

UNLOAD
Unload the entire contents of the named counter pool specified on the POOLNAME parameter to a sequential data set. When the unload processing has completed (normally or abnormally) the server program terminates.

The UNLOAD function requires a DD statement for DDNAME DFHNCUL describing the sequential data set to which the table pool is to be unloaded. The format of the unloaded data set is:

```
RECFM=F
LRECL=4096
BLKSIZE=4096
```

RELOAD
Reload, into the named counter pool named on the POOLNAME parameter, a previously unloaded named counter pool.

The RELOAD function requires a DD statement for DDNAME DFHNCRL, describing the sequential data set from which the table pool is to be reloaded.

The structure is allocated, if necessary, during reloading, in which case you can use the same server parameters to control structure attributes as for normal server startup. The reload process bypasses named counters that are already found in the pool (for example, because the structure was too small and the reload job had to be restarted after using ALTER to increase the structure size).

Note: If the unloaded pool structure was altered dynamically at any time after initial allocation (by using the SETXCF command to increase the size), ensure that the increased size is allocated for the reloaded pool. The recommended way is to update the INITSIZE parameter for the structure in the current CFRM policy whenever you alter the structure size, and to activate the updated policy using the SETXCF START,POLICY command. Alternatively, you can specify the required pool size in the POOLSIZE parameter in the reload JCL.

Note: If you omit the FUNCTION parameter, the server program initializes a named counter server address space.

For the UNLOAD and RELOAD function, the server program requires exclusive use of the list structure. If the structure is currently being used by a normal server, the unload or reload attempt is rejected. Similarly, if a normal server attempts to start up while an unload or reload job is in progress, the attempt fails because shared access to the structure is not available.

You can specify all normal server parameters when unloading or reloading, but some of these (for example, statistics-related parameters) are ignored because they do not apply to unload or reload processing.

If reloading fails because it runs out of space, the resulting messages include the numbers of named counters reloaded and blocks read up to the time of the failure. You can compare these values with those in the messages from the original unload job, to determine how many more named counters remain to be loaded.

Unload JCL example

The JCL in the following example shows you how to unload a named counter pool.

```
//UNLDNCD1 JOB  ...
//NCUNLOAD EXEC PGM=DFHNCMN        CICS named counter server program
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR  Authorized library
//SYSPRINT DD   SYSOUT=*           Options, messages and statistics
//DFHNCUL  DD   DSN=NC1.UNLOADED.POOL,  Unloaded named counter pool
//         DISP=(NEW,CATLG),
//         SPACE=(4096,(10000,1000))  Estimated size in 4K blocks
//SYSIN    DD   *
FUNCTION=UNLOAD                    Function to be performed is UNLOAD
POOLNAME=PRODNC1                   Pool name
/*
```

Figure 42. Unload JCL example

Reload JCL example

The following JCL example shows you how to reload a named counter pool.

```
//RELDNCD1 JOB  ...
//NCRELOAD EXEC PGM=DFHNCMN        CICS named counter server program
//STEPLIB  DD   DSN=CICSTS42.CICS.SDFHAUTH,DISP=SHR  Authorized library
//SYSPRINT DD   SYSOUT=*           Options, messages and statistics
//DFHNCRL  DD   DSN=NC1.UNLOADED.POOL,DISP=OLD  Unloaded pool
//SYSIN    DD   *
FUNCTION=RELOAD                    Function to be performed is RELOAD
POOLNAME=PRODNC1                   Pool name
/*
```

Figure 43. Reload JCL example

Dumping named counter pool list structures

You can use the MVS **DUMP** command to obtain a dump of the coupling facility list structure for a named counter pool.

About this task

For information on dumping and formatting a list structure, see the *CICS Problem Determination Guide*.

Chapter 25. Coupling facility server operations

The operations that you can perform on all three CICS coupling facility servers, for temporary storage, coupling facility data tables and named counters, are similar and the following information describes all three unless otherwise indicated.

Monitoring coupling facility server messages

The server issues various messages during execution, some of which might indicate that serious problems are developing, for example that the coupling facility structure is becoming full.

It is important to understand the types of messages that the server issues and to ensure that system status messages are monitored for possible problems.

Server messages

Messages that are issued by the server code itself start with the five-letter server prefix (DFHXQ, DFHCF or DFHNC).

These messages fall into the following groups:

- Operator console system status messages, which are issued by WTO (Write To Operator) with routing codes 2 (operator information) and 11 (programmer information), and descriptor code 4 (system status).

  These messages provide information about important status changes, primarily about the beginning and end of server initialization and the beginning and end of server termination, and about problems.

  Any server message that is issued in this way during normal running indicates a potentially serious problem, and should not be ignored. If this process is automated, a simple rule is to ignore the specific list of status messages for normal initialization and termination, and to treat any other server message as a warning.

  These messages can be issued either from the server address space or from a client address space. If the server code that requests the message is running in cross-memory mode, the message is passed back to a routine that issues the WTO in primary mode in the client address space. This avoids restrictions which apply to WTO messages that are issued in cross-memory mode. For example, cross-memory mode WTO messages do not appear in any job log.
- Command responses, which are issued by WTO with routing codes 2 and 11 and descriptor code 5 (immediate command response).

  These messages contain responses to server commands that are issued via the system MODIFY or STOP command, for example to display statistics.
- Job log messages:

  These messages typically contain diagnostic information, for example details of an abend or an attempted security violation. They are written to the job log, by WTO with routing code 11 (programmer information).
- Trace and statistics messages:

  These messages are written only to the server SYSPRINT file.

All messages that are issued by the server code, whether they are running under the server address space or in cross-memory mode from the client address space, are also copied to the server SYSPRINT file.

AXM messages

The AXM environment code issues operator messages from the server and client address spaces and from the master address space during AXM system services initialization.

These messages are issued using WTO with routing codes 2 (operator information) and 11 (programmer information, not used when running in the master address space), and descriptor code 4 (system status). AXM message numbers are of the form "AXMxxnnnns", where the first five characters "AXMxx" are the name of the module issuing the message, "nnnn" is the numeric part of the message number, and "s" is the suffix letter. The suffix letter is "I" if the message is a routine informational message, or is omitted if the message indicates an error. The suffix letter can be used by automation tools to distinguish routine informational messages from error situations.

AXM messages that are issued from the server environment (via AXM run-time environment routines linked with the server load module), are copied to the server SYSPRINT file as well. AXM also writes informational messages to the SYSPRINT file. These contain information such as initialization information and closedown statistics for storage management, and the main procedure entry point of the server module for diagnostic purposes.

Coupling facility storage management

The type of coupling facility structure that CICS uses for its temporary storage data sharing pools, coupling facility data table pools, and named counter pools is a keyed list structure.

A coupling facility list structure contains an array of numbered lists that contain entries with 16-byte keys. Each list is like a keyed file. Each entry has a fixed prefix area that contains its key and other control information, which includes an adjunct area of 64 bytes for program use. The prefix is followed by a chain of up to 128 256-byte data elements. The maximum data size is 32K bytes.

For named counters, the structure contains a single list, each entry uses only the prefix area, and there are no data elements.

Storage for entry prefixes, known as entry controls, and data elements is allocated from two storage pools within the structure, which are shared between all lists in the structure.

The storage in a list structure can be divided into two types:

- Fixed controls.

  Storage for fixed controls is preallocated at a fixed size for the life of the structure. This storage contains structure control information, including data buffer space, and an array of list headers, up to the maximum number of lists defined when the structure was created. For CICS, this number is the small number of lists used for CICS internal purposes, and the value specified for the parameters **MAXQUEUES** or **MAXTABLES**.

  The fixed controls include enough internal control areas to manage the maximum number of elements and entries that can exist in the structure, given the maximum structure size and the range of possible ratios of entries to elements, and an array of list headers to handle the maximum number of lists that can exist in the structure.

  You cannot increase the maximum size or the maximum number of lists without reallocating the structure, so you must be careful to specify large enough values when the structure is first allocated. However, if you specify a relatively large maximum size or number of lists, a large amount of storage is preallocated for fixed controls, so the initial size of the structure needed to store a given amount of data will be significantly larger than it would be with less generous allowance for expansion.

- Variable controls.

  Variable controls are partitioned into storage areas for entry controls (one per entry) and for data elements. You can adjust this partitioning dynamically by altering the ratio of entries to elements, converting storage for one type to the other type. CICS automatically issues a request to alter the ratio when one type of variable storage is running out but there is enough storage of the other type. You can alter the total size of the storage for variable controls dynamically by changing the size of the structure. This size must be within the range of sizes that are defined for the structure in the active coupling facility resource management (CFRM) policy, which are set at the time that the structure is created. You can change the structure size by using the system operator command `SETXCF ALTER,SIZE`. Alternatively, the operating system can change the structure size, depending on the automatic alter options that are specified in the CFRM policy when the structure is allocated.

In the CICS pool structures, each queue item, data table record, or named counter normally occupies one entry in the structure, together with the appropriate number of data elements. CICS uses additional entries for internal control purposes to maintain the index of currently defined queues or data tables, and to track which lists are currently in use and which previously used lists are now free and available for reuse. Even after all queues or data tables in a pool have been deleted, some entries in the control lists might remain in use.

The amount of storage required for internal control information depends on the level of functionality and performance of the coupling facility control code for the current coupling facility level (CFLEVEL). The storage requirements can increase for a higher CFLEVEL.

A good way to calculate storage requirements for the CICS pool structures is to use the web-based IBM CFSizer tool. See CFSizer. This tool works as follows:

1. It prompts for parameters that describe the amount of information to be stored in the structure.
2. It converts this information to numbers of lists, entries, and elements.
3. It communicates with a coupling facility at a current CFLEVEL to determine the amount of storage required to store the information with the specified amount of free space and room for expansion.

All structure sizes are rounded up to the next storage increment for the coupling facility level (CFLEVEL) at allocation time. For example, sizes are rounded up to the nearest 1 MB for CFLEVEL 16. For more information about the storage increments for different CFLEVELs, see the information about coupling facility control code support in *System z10® Processor Resource/Systems Manager™ Planning Guide*.

For information about the CPC support for different CFLEVELs and the function in each CFLEVEL, see CF levels.

For more information about calculating storage requirements, see the following topics:

- "Storage calculations for temporary storage data sharing" on page 329
- "Storage calculations for coupling facility data tables" on page 350
- "Named counter list structure storage" on page 391

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Managing the pool structure

It is important to watch out for signs that the pool structure is becoming full, as this might have a serious impact on all the applications that are using the pool.

Monitoring pool structure usage levels

Use the DISPLAY POOLSTAT server command to display the current usage level of the pool structure.

The DISPLAY POOLSTAT command produces messages DFHXQ0432I, DFHF0432I or DFHNC0432I. The most important information in these messages is the maximum percentage of lists, entries, and elements, used during the current statistics interval. For the named counter server, message DFHNC0432I only shows the number of entries because there is always one list and no elements.

Operator messages reporting on pool structure usage

Messages to the operator, for example DFHXQ0411I and DFHXQ0412I, are issued when threshold levels are reached for the numbers of entries or elements used.

Further messages are issued if the pool becomes full. You can set up automated operations processes to watch for these messages and alert your operators to the situation, or take corrective action, if necessary.

You can use the MVS operator command SETXCF ALTER,START with an increased SIZE option, to expand the structure, if the structure has not yet reached the maximum size that is defined in the CFRM policy.

Use of CFRM automatic ALTER to increase pool structure size

The coupling facility resource management (CFRM) policy can specify the keyword ALLOWAUTOALT(YES).

This allows the operating system to issue an ALTER command automatically when the structure is near to becoming full, to increase its size or to adjust the ratio of elements to entries. The threshold at which this happens is specified by the FULLTHRESHOLD keyword in the policy. The default threshold is 80%, which is the same as the default threshold at which the server itself issues an automatic ALTER command to optimize the ratio of entries to elements. The server's automatic ALTER process is more sophisticated, because it takes into account the peak usage of the structure within the current statistics interval, rather than just the current usage. Therefore it is best to ensure that the server's automatic ALTER process is triggered first, by making sure that the percentage values of the server's ENTRYWARN and ELEMENTWARN parameters are at least 5 percent less than the percentage value of the CFRM FULLTHRESHOLD keyword.

Using system-managed rebuild to increase pool structure size

If the structure has not many entries or elements left, but it has already reached its maximum size, you can still use system-managed rebuild to expand it dynamically without closing down the servers, if all the systems using the structure are at a level which supports this function.

First update the CFRM policy to increase the size to the required value, and then activate the updated policy using SETXCF START,POLICY. After this, you can rebuild the structure. The rebuild allocates a new instance of the structure that uses the updated policy, copies across the existing data, and then discards the old instance.

Increasing the number of data lists

If the number of data lists specified via the MAXQUEUES or MAXTABLES server parameter is too small, an attempt to allocate a new data list will fail with message DFHXQ0443 or message DFHCF0443.

There is no way to increase the number of lists without deleting and recreating the structure, which necessitates closing down all of the servers temporarily. You cannot use system-managed rebuild to increase the number of data lists because it copies this number from the existing structure.

You can preserve existing data by using the server program to unload it to a sequential file, and then using SETXCF FORCE to delete the existing structure. You can then use the server program again to reload the data, and allocate a new structure with the appropriate MAXQUEUES or MAXTABLES parameter.

Deleting or emptying the pool structure

If the pool structure is no longer required, or all of the data in the structure is to be discarded, you can delete a pool by closing down all the servers for that pool, and then using the SETXCF FORCE command to delete the structure.

If the server is subsequently started again for the same structure name, an empty structure will be created using the information in the active CFRM policy and the server initialization parameters.

Server connection management

A client CICS region establishes a cross-memory connection to a server the first time a request refers to the pool for that server. A single connection is established to each server, regardless of the number of tables, queues or counters that are accessed in the pool.

For coupling facility data table and temporary storage queue servers, a multi-threaded asynchronous connection is established. This connection allows requests to be overlapped up to a fixed maximum number of concurrent requests. Requests that exceed this maximum number are queued within the CICS region until a request thread becomes available.

For named counter servers, requests are processed synchronously using a single-threaded interface, and only one request can be active at a time for a given client region.

For information about managing failures in coupling facility connectivity, see the section about coupling facility connectivity recovery in *z/OS Parallel Sysplex Recovery*.

Terminating server connections

Each connection has a client side and a server side. If either side is terminated separately, the connection is no longer usable, although the other side might not be terminated until some time later.

A connection normally remains active until CICS is closed down. The connection is closed automatically as part of the resource management termination processing for the CICS quasi-reentrant TCB. During resource management termination, the connection termination routine on the client side issues a cross-memory call to the server to terminate the connection on the server side as well.

If you want to close down a server after all the CICS regions that are using it have terminated, for example when you are preparing to close down the system, first quiesce the server and then terminate it using the server STOP command (or the equivalent MVS STOP command). Use of the STOP command prevents any new CICS regions from connecting to the server and terminates the server as soon as all the CICS regions that are using it have been terminated.

If you need to close down a server immediately, while CICS regions are still connected to it, use the server CANCEL command, because the normal server STOP command, (or the MVS STOP command) is not effective until the connections have been terminated. You can also use the MVS CANCEL command to terminate the server, but this prevents the server from going through normal closedown processing.

Note that CICS cannot terminate the client side of the connection automatically. CICS has no way of knowing that the server wants to close down, because although the connection allows CICS to make cross-memory calls to the server, it does not provide any means for the server to notify CICS of asynchronous events. At present, CICS does not provide any means of terminating a connection on demand except in the case of the named counter server CALL interface which provides a FINISH function for this purpose, but this function is primarily for batch use.

If you terminate the server with CANCEL, the server side of each connection is terminated immediately, but the client side is not affected. The next request from CICS to use the original connection fails and CICS tries to establish a new connection instead. This succeeds if the server has been restarted. However, CICS does not close the old connection explicitly, so when it eventually terminates, messages are produced not only for the termination of any active connection, but also for the termination of any previous connections to the same server.

Failed server connections

If CICS terminates abruptly, without going through the normal resource manager termination processing for the quasi-reentrant TCB, for example because of a FORCE command or system completion code 40D, an end-of-memory resource manager routine cleans up the client side of the connection.

Because this routine does not run in the CICS region itself, it cannot use the cross-memory connection to notify the server. Therefore, if CICS terminates without carrying out the normal resource manager termination processing for the quasi-reentrant TCB, the server side of the connection might remain active. For coupling facility data tables this might cause problems because the server does not allow the original CICS region to resynchronize after restart if its APPLID is already in use.

From time to time the server checks the client status for each connection, and cleans up the server side of the connection if the client has gone away. This check is done once a minute, and it is also triggered each time a new connection is to be established. Therefore, any connections which have failed are normally cleaned up before the new connection attempts to resynchronize. Because the clean-up processing that terminates the server side of a connection is asynchronous, and might take one or two seconds, the clean-up processing might not be finished in time for the resynchronization from the original CICS region to succeed immediately, but if the resynchronization does not succeed on the first attempt, it should succeed when it is next retried.

Restarting a server

All three types of CICS data-sharing server (temporary storage, coupling facility data tables, and named counters) support automatic restart using the services of the Automatic Restart Manager (ARM).

The servers also have the ability to wait during start-up, using an Event Notification Facility (ENF) exit, for the coupling facility structure to become available if the initial connection attempt fails.

The server normally registers at start-up with ARM, so that it will be restarted automatically if it fails, subject to any rules in the installation ARM policy. If ARM registration fails for any reason except for ARM being unavailable, the server cannot be started. If ARM is unavailable, the server starts normally but has to be restarted manually if it fails.

The servers recognize the ARM return code that indicates that the ARM couple data set has not been formatted for the current MVS system, as being equivalent to ARM being unavailable.

A server does not start if registration fails with return code 8 or above.

When a server starts up, if it is unable to connect to its structure because of some environmental error such as a structure failure, it automatically waits for the structure to become available, using the Event Notification Facility (ENF) to watch for events relating to its structure. This wait occurs before the cross-memory interface is enabled, so the server is not visible to client regions at this time and will appear to be unavailable. While it is waiting, the server can be cancelled using the MVS CANCEL command if it is no longer required.

If the server is running normally, but the coupling facility interface reports a loss of connectivity or a structure failure, the server immediately terminates itself. This disconnects it from the coupling facility, and terminates the server side of any current cross-memory connections from client regions. The server will normally be restarted immediately by the ARM, but will continue to be unavailable to client regions until the coupling facility structure is available again (possibly as a new empty instance of the structure).

An abrupt coupling facility failure such as a power failure may result in a loss of connectivity indication even though the structure has failed, because the operating system cannot determine the state of the structure in that case. This could prevent a new structure from being allocated until the operating system can determine the status of the existing structure, for example after the failed coupling facility has been successfully restarted. If it is certain that the old structure has been lost, but the system has not yet recognized the fact, the operator may be able to save some time by issuing the SETXCF FORCE command to delete the old structure, allowing the system to go ahead and create a new instance of the same structure in a different coupling facility.

You can find more information about automatic restart of coupling facility servers in the *CICS Recovery and Restart Guide*

Chapter 26. CICS server support for system-managed processes

The three servers, temporary storage data sharing, coupling facility data tables, and named counters, support system-managed processes for coupling facility list structures.

These system-managed processes are:
- "System-managed list structure rebuild"
- "System-managed list structure duplexing" on page 413

System-managed list structure rebuild

System-managed rebuild allows z/OS to manage the moving of coupling facility structures used for shared temporary storage, coupling facility data tables, and named counter server pools, without recycling the CICS system using them.

Before this, you could move a structure by using server functions to UNLOAD to a sequential data set and then RELOAD elsewhere from the data set, but the switch caused errors in CICS such that restart was recommended, which in some situations was an unacceptable outage.

System-managed rebuild rebuilds the contents of a coupling facility list structure to a new location. The only impact when rebuild occurs is that requests are temporarily suspended within MVS during the few seconds or tens of seconds needed for rebuild processing. The system-managed rebuild process rebuilds only from one structure to another. Therefore, it is not applicable when the original structure has been lost or damaged. It is very useful for planned maintenance and is used for recovery purposes where connectivity to the structure has been lost from one or more systems but at least one system still has access to the original structure. For a loss of connectivity, the system does not initiate a system-managed rebuild automatically, regardless of connectivity options in the policy, but a rebuild can be requested using an operator command.

Any pending requests are made to wait during system-managed rebuild. Apart from the time delay, the application should not notice anything unusual when a system-managed rebuild occurs. For more information about system-managed rebuild, see *z/OS MVS Programming: Sysplex Services Guide*.

CICS supports the MVS system-managed rebuild facility, provided that the SUSPEND=FAIL option of the IXLCONN macro is available. The CICS servers detect automatically whether this support is available.
- If SUSPEND=FAIL support is available, a server connects to its list structure specifying the ALLOWAUTO=YES option of the IXLCONN macro.
- If SUSPEND=FAIL is not available, a server connects with ALLOWAUTO=NO, and the system-managed rebuild facility is not used.

When a server is active, you can use the MVS operator `DISPLAY XCF,STR` command to display the connection details in message IXC360I.

For example, to look at the connection details for structure DFHXQLS_PRODTSQ1, use the following command:

```
     Display  XCF,STR,STRNAME=DFHXQLS_PRODTSQ1,CONNAME=ALL
```

To look at the connection details for coupling facility data tables structure DFHCFLS_DTPOOL1, use the following command:

```
    Display  XCF,STR,STRNAME=DFHCFLS_DTPOOL1,CONNAME=ALL
```

To look at the connection details for the named counter structure DFHNCLS_PRODNC1, use the following command:

```
    Display  XCF,STR,STRNAME=DFHNCLS_PRODNC1,CONNAME=ALL
```

Using the above command, the resulting IXC360I message output contains the following lines (under the CONNECTION information section), indicating that system-managed rebuild is enabled for the connection:

```
 ALLOW AUTO      : YES
  SUSPEND        : FAIL
```

TS data sharing and CFDT servers

For temporary storage data sharing and coupling facility data tables, any pending requests are made to wait during system-managed rebuild. Apart from the time delay, the application should not notice anything unusual when a system-managed rebuild occurs.

Timeout considerations

The wait-time for a system-managed rebuild is expected to vary from a few seconds for a small structure to a few tens of seconds for a large structure. This means that transactions can be purged by DTIMOUT, or by an operator command, while waiting on the rebuild.

To minimize the risk of unnecessary problems caused by timeouts during syncpoint processing, the CICS wait exit for CFDT unit of work control functions specify that the wait is not purgeable.

Note: Making the wait for CFDT unit of work control functions non-purgeable does not apply to CICS TS 1.3 regions connected to a later level of the CFDT server that supports system-manmaged rebuild. In this case, if a transaction makes any recoverable changes to a coupling facility data table before being purged, it will probably go into a wait again during syncpoint processing. If this happens, it should be left waiting until the rebuild completes, because any further attempt to purge it could result in the UOW being shunted as having failed during syncpoint. If the UOW is shunted in these circumstances, it will require manual intervention to retry syncpoint processing and complete the UOW when the structure becomes available again.

Named counter server

Requests issued using the CALL interface to the named counter server are not made to wait during rebuild, but instead the server returns a new environment error return code with value 311, under the NC_ENVIRONMENT_ERROR category.

An EXEC interface request during rebuild waits using a timer wait and retry loop which can be interrupted by an operator purge command but is not eligible for DTIMOUT, since the wait is definitely known not to be caused by any form of deadlock.

Compatibility considerations

The named counter client region interface module DFHNCIF normally resides in a linklist library and should be at the highest level of CICS TS in use within an MVS image.

If a CICS region is running a CICS TS 2.2 or later level of DFHNCIF (from the link list) but the EXEC CICS interface is from CICS TS 2.1 or earlier, the named counter server does not wait and retry during rebuild, but instead returns INVREQ with RESP2 code 311.

If a program running in a region that is using a CICS TS 2.1 or earlier DFHNCIF issues a request to a CICS 2.2 or later level of the server during a rebuild, CICS returns error code 301, UNKNOWN_ERROR. For the EXEC interface, this is mapped to an INVREQ with RESP2 code 301.

System-managed list structure duplexing

System-managed coupling facility duplexing provides a general-purpose, hardware-assisted mechanism for duplexing coupling facility structure data.

It is a robust mechanism that provides recovery from failures such as loss of a single structure or coupling facility, or from loss of connectivity, by a rapid switch to the other structure in a duplex pair.

Unlike system-managed rebuild, which can rebuild only from one structure to another, and is not applicable when the original structure has been lost or damaged, system-managed duplexing creates and maintains a duplexed copy of a structure in advance of any failure. It is largely transparent to the users of the structure, and is available for both planned and unplanned outages of a coupling facility or structure. For example, until CICS TS 2.2, coupling facility data tables and temporary data sharing structures have contained mostly “scratch-pad” information that is not critical to recover. With duplexing, you can use the coupling facilities to store more critical information.

Transactions that are accessing a duplexed structure might experience delays, which could result in the DTIMOUT threshold being reached, when:

- A structure is quiesced by MVS while duplexing is being established.
- A structure is quiesced as a a result of an operator command to stop or start duplexing.
- A structure is switched to the secondary structure or back to the primary structure.

A newly-started data sharing server is not allowed to connect to a structure during any phase of a duplexing rebuild until the duplex established phase is reached.

System-managed duplexing is built on the system-managed rebuild function. However, whereas system-managed rebuild requires OS/390 with APAR OW39892, system-managed duplexing requires z/OS Version 1 Release 2 with an enabling APAR. You also need to specify the DUPLEX option, in the CFRM policy information for the structure, as either DUPLEX(ENABLED) or DUPLEX(ALLOWED). If you specify DUPLEX(ENABLED), MVS will initiate and attempt to maintain a user-managed duplexing operation for the structure. If you specify DUPLEX(ALLOWED), an operator can start duplexing, using the SETXCF

START,REBUILD,DUPLEX command. You also need to ensure that coupling facilities that are taking part in duplexing operations communicate with one another through a “peer link”.

For more information about system-managed duplexing, see *z/OS MVS Programming: Sysplex Services Guide* and *z/OS MVS Setting Up a Sysplex*.

Part 4. Appendixes

Notices

Trademarks

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General

CICS Transaction Server for z/OS Program Directory, GI13-0565
CICS Transaction Server for z/OS What's New, GC34-7192
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CICSPlex SM Messages and Codes, GC34-7201
CICSPlex SM Problem Determination, GC34-7203

Other CICS publications

The following publications contain further information about CICS, but are not provided as part of CICS Transaction Server for z/OS, Version 4 Release 2.

Designing and Programming CICS Applications, SR23-9692

CICS Application Migration Aid Guide, SC33-0768

CICS Family: API Structure, SC33-1007

CICS Family: Client/Server Programming, SC33-1435

CICS Family: Interproduct Communication, SC34-6853

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CICS Transaction Gateway for z/OS Administration, SC34-5528

CICS Family: General Information, GC33-0155

CICS 4.1 Sample Applications Guide, SC33-1173

CICS/ESA 3.3 XRF Guide , SC33-0661

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The following publications contain information about related IBM products.

DB2

DB2 for OS/390 and z/OS Administration Guide , SC26-9931
DB2 for OS/390 and z/OS Application Programming and SQL Guide , SC26-9933

MVS

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OS/390 Parallel Sysplex Application Migration, GC28-1863.

Java

IBM Developer Kit and Runtime Environment, Java 2 Technology Edition, Version 1.4.2 Diagnostics Guide, SC34-6358

Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

You can perform most tasks required to set up, run, and maintain your CICS system in one of these ways:

- using a 3270 emulator logged on to CICS
- using a 3270 emulator logged on to TSO
- using a 3270 emulator as an MVS system console

IBM Personal Communications provides 3270 emulation with accessibility features for people with disabilities. You can use this product to provide the accessibility features you need in your CICS system.

Index

Readers' Comments — We'd Like to Hear from You

CICS Transaction Server for z/OS
Version 4 Release 2
System Definition Guide

Publication No. SC34-7185-01

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