CICS® Transaction Server for VSE/ESA™

Migration Guide

Release 1

IBM

CICS® Transaction Server for VSE/ESA™

Migration Guide

Release 1

IBM

First Edition (June 1999)

Contents

3

5

4

5

Preface

Who this book is for

4

Read this book if you are responsible for planning and managing your installation's migration to CICS Transaction Server for VSE/ESA Release 1 (CICS TS Release 1) from CICS for VSE/ESA Version 2.3

What you need to know to understand this book

The book assumes that you are an existing CICS user, and that you are familiar with CICS either as a systems administrator or as a systems or application programmer.

This book does not describe in detail all the new functions available. Before using this book, you should read the *CICS Release Guide* for information about the new functions on offer and their benefits to your installation.

Refer to the appropriate publication in the CICS TS Release 1 library for detailed information about specific topics, such as parameter and command descriptions.

What this book is about

This book describes the changes you need to make to migrate to a CICS TS Release 1 region that is, at the very least, functionally equivalent to your CICS regions running under the previous release. If you are migrating from CICS/VSE 2.2 or earlier, read the appropriate CICS for VSE/ESA Version 2.3 documentation and migrate to CICS for VSE/ESA Version 2.3 before attempting to migrate to CICS TS Release 1.

This book aims to help you develop a successful migration plan. The importance of thorough planning before you actually start to migrate system components and programs cannot be overstated. CICS has changed significantly in this release, therefore a review of each functional area is essential.

This book is divided into nine parts:

Part	Description	Starting on ...
Part 1	Introduces the subject of migration and describes: • A possible migration strategy. • The concept of coexistence; outlining the situations where you may need to run CICS for VSE/ESA Version 2.3 regions alongside migrated regions. Some typical migration scenarios for both single CICS and MRO-connected regions are described to help you. • A summary of the hardware and software prerequisites you need to successfully install and run CICS. • The installation process and the possible impacts the removal of the system generation process can have on your installation.	page 1
Part 2	Describes intercommunication between CICS systems. **Intersystem communication (ISC)** and **multiregion operation (MRO)** are the two main facilities provided for this purpose. MRO in particular may be more important to you now than it has been in the past because you may need to run a CICS for VSE/ESA Version 2.3 system together with a CICS TS Release 1 region (coexisting). MRO is a key part of any coexistence strategy (and short-term production running) because it allows the different release to communicate with each other and allows you to continue using withdrawn facilities until the task of migration is completed.	page 24
Part 3	Gives you some background information about the new CICS architecture and describes the new domain structure. In particular, it concentrates on the storage requirements of your new CICS system (parameters, space for the various CICS data sets, and so on). It also looks at the changes made to the initialization process.	page 47
Part 4	Looks at resource definition. The use of a CSD is mandatory and various CICS resources can no longer be defined to CICS using table macros. You must familiarize yourself with resource definition online (RDO) before you can get CICS up and running. This part outlines the changes made to the different resource definitions, and describes what has happened to the table macros.	page 83

Part	Description	Starting on ...
Part 5	Discusses the large subject of programming. Because the macro-level programming interface is obsolete, all application programs must conform to command-level standards. The best ways for you to migrate to a command-level programming environment are discussed, looking in particular at: • Application compatibility • Command and macro-level application programming interfaces • Access to CICS internal control block data • User exits and user replaceable modules A summary of new and changed EXEC CICS INQUIRE and SET commands is also given, together with changes to CICS-supplied transactions, such as CEMT and CEDA.	page 112
Part 6	Considers security aspects. CICS internal security is replaced by using an external security manager (ESM) that conforms to the VSE/ESA System Authorization Facility (SAF) RACROUTE interface. This book looks at what securing your CICS system means in terms of the extra work involved in setting up an ESM database and defining the various security profiles and authorizations required.	page 164
Part 7	Looks at the subject of testing and describes the changes made to problem determination tools. Trace and dump information is easier to control and to interpret. Messages have changed, adopting a new standard appearance with useful symptom string information should you need to contact your IBM support center. Changes to nearly every CICS message may have a big impact on your installation if you use automated operating procedures.	page 192
Part 8	Looks at the performance implications of a large migration effort and how you can maintain a tolerable level of performance during your initial migration and testing phases. The significant changes made to CICS statistics and monitoring facilities are summarized.	page 213
Part 9	Comprises a series of appendixes and the index for this book.	page 227

Notes on terminology

The terms listed in Table 1 are commonly used in the CICS Transaction Server for VSE/ESA Release 1 library. See the *CICS Glossary* for a comprehensive definition of terminology.

Table 1 (Page 1 of 2). Commonly used words and abbreviations	
Term	**Definition (and abbreviation if appropriate)**
$(the dollar symbol)	In the character sets and programming examples given in this book, the dollar symbol ($) 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.
BSM	BSM is used to indicate the basic security management supplied as part of the VSE/ESA product. It is RACROUTE-compliant, and provides the following functions: • Signon security • Transaction attach security
C	The C programming language
CICSplex	A CICSplex consists of two or more regions that are linked using CICS intercommunication facilities. Typically, a CICSplex has at least one terminal-owning region (TOR), more than one application-owning region (AOR), and may have one or more regions that own the resources accessed by the AORs
CICS Data Management Facility	The new facility to which all statistics and monitoring data is written, generally referred to as "DMF"
CICS/VSE	The CICS product running under the VSE/ESA operating system, frequently referred to as simply "CICS"
COBOL	The COBOL programming language
DB2 for VSE/ESA	Database 2 for VSE/ESA which was previously known as "SQL/DS".

Table 1 (Page 1 of 2). Commonly used words and abbreviations	
Term	**Definition (and abbreviation if appropriate)**
ESM	ESM is used to indicate a RACROUTE-compliant external security manager that supports some or all of the following functions: • Signon security • Transaction attach security • Resource security • Command security • Non-terminal security • Surrogate user security • MRO/ISC security (MRO, LU6.1 or LU6.2) • FEPI security.
FOR (file-owning region)—also known as a DOR (data-owning region)	A CICS region whose primary purpose is to manage VSAM and DAM files, and VSAM data tables, through function provided by the CICS file control program.
IBM C for VSE/ESA	The Language Environment-conforming version of the C programming language compiler. Generally referred to as "C/VSE".
IBM COBOL for VSE/ESA	The Language Environment-conforming version of the COBOL programming language compiler. Generally referred to as "COBOL/VSE".
IBM PL/I for VSE/ESA	The Language Environment-conforming version of the PL/I programming language compiler. Generally referred to as "PL/I VSE".
IBM Language Environment for VSE/ESA	The common runtime interface for all LE-conforming languages. Generally referred to as "LE/VSE".
PL/I	The PL/I programming language
VSE/POWER	Priority Output Writers Execution processors and input Readers. The VSE/ESA spooling subsystem which is exploited by the report controller.
VSE/ESA System Authorization Facility	The new VSE facility which enables the new security mechanisms in CICS, generally referred to as "SAF"
VSE/ESA Central Functions component	The new name for the VSE Advanced Function (AF) component
VSE/VTAM	"VTAM"

Determining if a publication is current

IBM regularly updates its publications with new and changed information. When first published, both the printed hardcopy and the BookManager softcopy versions of a publication are in step, but subsequent updates are normally made available in softcopy before they appear in hardcopy.

For CICS Transaction Server for VSE/ESA Release 1 books, softcopy updates appear regularly on the *Transaction Processing and Data Collection Kit* CD-ROM, SK2T-0730-xx and on the *VSE/ESA Collection Kit* CD-ROM, SK2T-0060-xx. Each reissue of the collection kit is indicated by an updated order number suffix (the -xx part). For example, collection kit SK2T-0730-20 is more up-to-date than SK2T-0730-19. The collection kit is also clearly dated on the front cover.

For individual books, the suffix number is incremented each time it is updated, so a publication with order number SC33-0667-02 is more recent than one with order number SC33-0667-01. Updates in the softcopy are clearly marked by revision codes (usually a "#" character) to the left of the changes.

Note that book suffix numbers are updated as a product moves from release to release, as well as for updates within a given release. Also, the date in the edition notice is not changed until the hardcopy is reissued.

Part 1. Planning and installation

Table 2. Planning and installation road map	
If you want to ...	**Refer to...**
Know what your key migration tasks are	"Key migration tasks" on page 3
Know about emulation modes	"Before you start, a word about emulation modes" on page 4
Know how to develop a migration strategy	Chapter 2, "Migration planning and control" on page 5
Look at an example migration strategy	"A possible migration strategy" on page 5
Know what hardware you need to run CICS	"Hardware prerequisites" on page 11
Know what software you need to run CICS	"Software requirements" on page 14
Know how to install CICS TS Release 1	Chapter 4, "Installing CICS" on page 19
Find out about the impacts of the removal of the system generation process	Chapter 5, "System generation (SYSGEN)" on page 23

Chapter 1. Introduction to CICS migration

4
4
4
4

Installing a new version of CICS and migrating existing applications to it is always a large undertaking. Although having CICS TS Release 1 incorporated into the VSE/ESA 2.4 system package simplifies installation and migration procedures, there are still potential pitfalls—which you can avoid if you devote sufficient time to detailed and thorough planning.

Migrating means moving your existing applications to the new platform while continuing to achieve the same level of function that you have on the earlier release of CICS. **It does not involve using new function**.

This means, for example, that you should set the CICS options so that you have the same kind of operator interface, the same level of tracing, and continue to be able to use the same application packages as on your earlier release. When you have done this, you can evaluate the new functions available, and select the ones to adopt in a post-migration phase.

Key migration tasks

> **Note**
>
> This book assumes that you are migrating from CICS for VSE/ESA Version 2.3. If you are migrating from CICS/VSE 2.2 or earlier, read the appropriate CICS for VSE/ESA Version 2.3 documentation and migrate to CICS for VSE/ESA Version 2.3 before attempting to migrate to CICS TS Release 1. CICS for VSE/ESA Version 2.3 is the only release that can coexist with CICS TS Release 1.

3
3

CICS TS Release 1 is a major new version of CICS running on the VSE/ESA platform. Based on CICS for MVS/ESA Version 4 Release 1, it contains new functions, extends existing functions, and uses a restructured code base that enhances the reliability, availability, and serviceability of CICS. In addition, CICS contains new interfaces that allow you to make fuller use of other IBM products. These changes affect some of the characteristics of a CICS system, and this in turn can have an impact on migration. To minimize the effects of these changes, CICS maintains object compatibility with command-level applications. Wherever possible, external interfaces remain as they were in CICS for VSE/ESA Version 2.3.

The amount of work needed to migrate depends on what you have done with your system in the past. If you use CICS with little or no customization, and if the majority of your application programs are written to the command-level programming interface, much of the migration work is quite straightforward. In general, check:

- Your current use of CICS functions against the changes made, and make the necessary adjustments to your programs, job control language (JCL), and operating procedures.

3

- Your exit programs, if you have customized your CICS system through user exit programs and user-replaceable programs, because some changes mean that you will need to rewrite some of them.

- If you have customized CICS, or have written system programs that use unsupported interfaces or reference CICS internal control blocks. If you have, reassess your use of CICS and design your code to use supported interfaces only.

Coexistence

4
4
4

If you have applications that use discontinued functions, you can continue to run them under CICS for VSE/ESA Version 2.3 until you no longer need these applications.

For example, although devices and controllers accessed through BTAM are no longer supported, ongoing support can be provided by transaction routing from a CICS for VSE/ESA Version 2.3 terminal-owning region.

Similarly, macro-level application programs can continue to run on a CICS for VSE/ESA Version 2.3 region and can share data owned by the CICS for VSE/ESA Version 2.3 system with a CICS TS Release 1 region.

As well as being the long-term coexistence base, CICS for VSE/ESA Version 2.3 has many advantages over earlier releases of CICS/VSE, including the early use of some CICS/ESA functions and a degree of virtual storage constraint relief (VSCR).

Before you start, a word about emulation modes

Much of the enhanced function is made possible by the use of OS/390-compatible interfaces available with the VSE/ESA 2.4 system package. To use these interfaces, CICS must run in OS390 emulation mode. To activate OS390 emulation mode, add the OS390 parameter to the VSE // EXEC statement in your startup JCL as follows:

4

```
// EXEC DFHSIP,SIZE=DFHSIP,...,OS390
```

The OS390 parameter must be the last one on the // EXEC statement. If you do not specify the OS390 parameter, VSE runs in normal 370 (VSE) mode, which is how CICS for VSE/ESA Version 2.3 is supported.

Chapter 2. Migration planning and control

This chapter gives general guidance about planning and controlling the migration process. Depending on the type of CICS system you use and on the working practices of your business, modify the suggestions made here to meet your needs. The complexity and variety of possible CICS configurations means that there is no single list of instructions for migration planning and implementation. However, by combining the information in this chapter with the descriptions of changes in the rest of this book, you can produce a sound framework on which to build your migration strategy.

Points to consider when planning your migration strategy

Migrating requires careful planning and change management. To achieve this:

- Understand the practical migration issues and detailed product changes

- Plan a complete conversion strategy.

- Plan the required actions to achieve that strategy.

- Accurately estimate the resources and time required to achieve that strategy.

You can maintain service levels to your users during the migration process by adopting good change-management practices; for example:

- Minimize the number of changes that take place simultaneously.

- Test all changes throughly before putting them into production, and have a backout or fallback strategy for each change in case it fails in production.

- Assess the impact of a change before you introduce it into your production system. If possible, have procedures in place to limit its effects.

- Schedule the change or cutover so that it has a minimal impact on your end users and on your business.

Successfully meeting these change-management requirements depends partly on what you have done with your existing CICS systems, and partly on the migration strategy you adopt.

A possible migration strategy

To apply the general rules described in this chapter, a phased conversion and cutover is needed. One possible migration strategy comprises the following phases:

1. Planning your migration
2. Positioning your system on CICS for VSE/ESA Version 2.3
3. Installing, testing, and running your CICS systems in parallel
4. Cutting over to the new system in stages.

The planning phase

During the planning phase you develop a migration strategy, and produce formally documented detailed plans for each step of the migration process for use in project management and control.

Table 3 (Page 1 of 2). Migration strategy—Planning tasks	
Task	**Consider ...**
Obtain details of co-requisite and prerequisite software and hardware. Plan to migrate to the appropriate product levels where necessary.	The ordering and delivery lead times when calculating your schedules.
Estimate and plan the machine resources required for the migration.	Resources such as VSE partitions, disk and library space, and terminals, as well as the machine time needed for installation, development, and testing.
Determine which resources (tables, programs, and so on) need to be frozen during the migration process.	—
Determine where programming changes may be required and plan for the necessary coding and testing resources.	The changes that must be made to macro-level applications, programs written in unsupported languages, customized user exits and so on.
Plan to update your programming standards and any supporting documentation.	—
Plan for the installation of the basic CICS system. This is integral to VSE/ESA installation and is required for Interactive Interface (II) support.	—
Evaluate the actions required by any associated products that have been added to your CICS system.	Liaising with third party software vendors.
Plan conversion steps, such as table changes, implementation of RDO, preparation of JCL, and so on.	Moving to RDO for supported resources on your CICS for VSE/ESA Version 2.3 system before migrating.
Evaluate what your education and training requirements are.	Enrolling personnel on relevant CICS and VSE courses.
Develop a plan to update your operational procedures and any supporting documentation.	The changes made to messages and the changes in dataset names.
Determine the testing criteria you require.	Extending the scope of testing beyond "normal" migrations. For example, if you plan to use a coexistence environment, you should introduce MRO testing (or extend such testing for existing MRO users).
Plan the cutover phases.	Using MRO to stage this.
Decide how to keep your users informed of any changes to function or service that might affect them.	—

Table 3 (Page 2 of 2). Migration strategy—Planning tasks	
Task	**Consider ...**
Develop a plan to update your problem determination procedures and the supporting documentation.	The many changes made to dump, trace, and messages in particular.
Discuss any issues raised by running CICS releases in parallel.	Running a pilot MRO system on CICS for VSE/ESA Version 2.3, before migrating, if you are not already familiar with MRO. This may help you understand the differences between MRO and ISC.

The positioning phase

During the positioning phase you upgrade your existing VSE and CICS systems to reduce the number of changes you need to make when you cut over to CICS TS Release 1. Using the predefined CICS system provided in the VSE/ESA 2.4 system package, the tasks listed in Table 4 may be required.

Table 4. Migration strategy—Positioning tasks	
Task	**Consider ...**
Set up a CICS system definition (CSD) data set with your own definitions if you have not used RDO before.	Converting to using a CSD on CICS for VSE/ESA Version 2.3. In doing so, you can stage the conversion and use the tables method as a fallback in case of unforeseen difficulties.
Migrate your PPTs and PCTs to the CSD.	See box above.
Migrate your TCTs to the CSD.	Starting out on a CICS for VSE/ESA Version 2.3 system where the change can be tested and introduced in stages. This is particularly important for TCT migration where the variety of possible CSD resource definitions, including autoinstall, makes careful testing and the availability of a fallback position very important.
Divide your CICS system into multiregion operation (MRO) linked regions suitable for migration.	The advantages of a phased migration that a MRO system allows. If you do not currently use MRO, you may want to consider moving to a multiregion system before starting migration.
Create an application-owning region to contain those applications (probably old macro-level programs that may not conform to the supported interfaces) that you do not wish to migrate until they can be converted to use command-level API and other documented functions.	A careful review of your application program inventory to identify those programs you need to keep on a CICS for VSE/ESA Version 2.3 system. If you are in any doubt about a program, use the DFHMSCAN utility to help you decide. See "DFHMSCAN" on page 118 for more information.
Create a terminal-owning region to support unsupported devices, such as BTAM.	Using your CICS for VSE/ESA Version 2.3 BTAM TCT definitions, and add these as remote definitions to CICS TS Release 1.

The installation phase

Table 5. Migration strategy—Installation tasks	
Task	**Consider ...**
Install and tailor the basic CICS region ready for testing and parallel running.	A careful review of the VSE/ESA 2.4 installation publications. Try to change as little as possible to begin with.
Implement the programs and procedures needed to support CICS TS Release 1 processing (for example, monitoring and accounting packages, statistics printing, dump printing, journal handling, and so on).	Contacting your third-party software suppliers early to ensure that they can deliver versions of their products that support CICS TS Release 1.

Cutting over in stages

The objective of a phased cutover is to gradually migrate your working regions from CICS for VSE/ESA Version 2.3. The most efficient way to do this is by region and by logical groupings within regions (groups of related terminals, suites of application programs, and so on). Each type of CICS region has its own cutover characteristics. Your plan should take these differences into account. The types of CICS region considered here are:

1. Terminal-owning regions (TORs)

2. Application-owning and data-owning regions (AORs and DORs)

3. Single-region systems

4. Regions that cannot be migrated as a whole. An example of such a region is one containing old macro-level programs that cannot be migrated. You may need to retain such a region at the CICS for VSE/ESA Version 2.3 level until the individual programs can be rewritten using the CICS command-level API and conform to the supported and documented interface. Until this is done, you may need to adopt a coexistence strategy, such as the schemes discussed in Chapter 7, "Coexistence strategies" on page 29.

Terminal-owning regions

If a TOR is already running using RDO, you can migrate it in a single step, or in stages (as groups of terminals), leaving any AORs and DORs unchanged.

By starting the cutover process with the TOR, you gain operational experience of a migrated region without having to become involved in many of the more complex aspects of the system that would be necessary if cutover began with an AOR or a DOR.

Application- and data-owning regions

The cutover process for AORs and DORs depends on the application and data structures used in your system. Broadly speaking, you need to estimate the impact of cutover (and any potential regressions) for each region, and then proceed step by step; always maintaining an adequate fallback position. The smaller the steps taken in cutting over AORs and DORs, the smaller the chances of serious difficulties for your users and your business.

Using test regions: Using MRO and an intermediate test region (with appropriate security and integrity controls in place) can help you to migrate applications and data in small steps. Testing work can be isolated from production work, and you can maintain the reliability and availability of your production system during regression testing. Your test system can be brought up and taken down as necessary, without interrupting production work.

If you use function shipping, you can give test programs controlled access to resources such as files or transient data queues belonging to your production system.

If you use transaction routing, you can run test transactions on terminals connected to your production system.

Single-region systems
Single-region systems can be the most difficult systems to migrate because you need to make a large number of changes simultaneously.

Wherever possible, run CICS TS Release 1 together with CICS for VSE/ESA Version 2.3 and try to migrate groups of terminals, suites of applications, and their associated data one at a time. Your ability to do this depends on the nature of the applications, or groups of applications, that you are running.

Regions or applications that cannot be migrated
Plan to convert macro-level applications to the CICS command-level API where it is economical to do so.

If you have macro-level programs that will become obsolete in the foreseeable future (and are therefore not worth your while converting to command level), you can leave them and their associated data on your CICS for VSE/ESA Version 2.3 system until they are no longer needed.

See Chapter 7, "Coexistence strategies" on page 29 for more information about running earlier releases of CICS for VSE with CICS TS Release 1.

However, your long-term aim should be to migrate all applications to the CICS API, or to find equivalent command-level implementations that suit your needs. (These may be purchased from a vendor.)

Chapter 3. Prerequisites and migration paths

How you migrate your system depends on the level of CICS and the associated products you are already using.

Use the operating system, hardware, and software release information given in this chapter to help you plan the migration of CICS and its associated products.

VSE/ESA Version 2 Release 4 requirements

5
5
5

CICS Transaction Server for VSE/ESA Release 1 is available only as part of VSE/ESA™ Version 2 Release 4. The software required by CICS is supplied with VSE/ESA V2.4.

5 Other VSE/ESA components or subsystems

5
5

Table 6 gives release information for some of the main VSE/ESA components and subsystems.

Table 6. Release information for VSE/ESA components		
Product	**Release number**	**Product number**
VSE/ESA Central Functions component	Version 6 Release 4	5686-066
VSE/VSAM **1**		5686-037
VSE/POWER **1**		5686-033
VSE/ICCF **1**		5686-036
VTAM **2** **3**	Version 4 Release 2	5686-065
DITTO/ESA for VSE **2**	Version 1 Release 3	5648-099
LE/VSE **2**	Version 1 Release 4	5686-094
Notes:		
1 Included in VSE/ESA Version 2 Release 4 as part of the Central Functions component.		
2 Included in VSE/ESA Version 2 Release 4 as a base program.		
3 For persistent session support, the inter-enterprise option is required—this is not supplied as part of the base program.		

5
5

For detailed information about the base and optional programs provided, see the *VSE/ESA Version 2 Release 4 Planning* manual.

Hardware prerequisites

Use the following sections to verify that you have the required hardware:

* Processors, including hardware for storage protection
* Device support, covering terminal devices, DASD, tapes, and printers.

Processors

CICS runs on processors capable of supporting VSE/ESA Version 2 Release 4 (or upward compatible release) in **ESA mode only**. These processors include Enterprise Systems Architecture/390® (ESA/390™) processors that meet the requirements of the host operating system, CICS, access methods, and user application programs. 370 and XA processors are not supported.

Hardware requirements for storage protection support

To use storage protection facilities, you need an ESA/390 processor that supports the subsystem storage protection facility, and which meets the requirements of the host operating system, CICS, the access methods, and your own application programs. Any of the following IBM ES/9000® machines are suitable:

- ES/9000 9021 Model 520, 640, 660, 711, 740, 820, 860, 831, 832, 860, 900, 941 or higher

- ES/9000 9121 Model 180, 190, 210, 260, 311, 320, 411, 440, 480 490, 511, 521, 522, 570, 610, 621, 622, 732 or 742

- ES/9000 9221 Model 170 or 200.

4
4
Other models may require an engineering change to be able to provide the function.

Device support

The following sections outline the changes to support for various devices.

Devices connected using VTAM

4
4
All previously supported VTAM terminals are able to communicate with CICS TS Release 1. New or current terminals are directly supported by CICS if they conform to the VTAM interface.

The list of device and system types supported, with modes of connection, is shown in Table 7 on page 13.

Devices connected using BTAM

3
3
#
#
CICS no longer supports devices and controllers accessed using BTAM unless they are defined as remote. If they are defined as remote devices, they can communicate with CICS using interregion communication (IRC) from a CICS for VSE/ESA Version 2.3 region to which they are locally defined. The list of device and system types supported, with modes of connection, is shown in Table 7 on page 13.

DASD

Support for data sets on any new DASD device is transparent to CICS because it uses standard access methods.

Tapes

Support for data sets on any new tape device is transparent to CICS because it uses standard access methods.

#
#
#
CICS continues to support current tape devices, including early 3480 tape devices, although these are not recommended for tape logging, and CICS does not support the use of 3480 follow-on tape devices for tape logging.

There are no restrictions on the use of tape devices for extrapartition data.

Printers

Support for any new VTAM-attached printers is transparent to CICS and should not affect CICS programs.

CICS does not support native Advanced Function Printer (AFP™) devices. The EXEC CICS SPOOL API was enhanced in CICS/VSE® Version 2 so that you can specify attributes that are meaningful to the appropriate device driver products (for example, Print Service Facility (PSF)).

Sequential terminal support

CICS continues to support the use of sequential terminals and printers.

Supported device and system types

The following are supported:

Table 7 (Page 1 of 2). Supported system and device types	
Direct connection to CICS using VTAM	**Connection using transaction routing through CICS for VSE/ESA Version 2.3 (BTAM terminals)**
3101 Display Terminal (see note)	1050 Data Communication System
3230 Printer (see note)	2740 Communication Terminal
3268 Printer	2741 Terminal controller
3270 Information Display System (see note)	2770 Data Communication System
3270 PC (see note)	2780 Data Transmission Terminal
3270 PC/G (see note)	2980 General Banking Terminal System
3270 PC/GX (see note)	3660 Supermarket System
3287 Printer	3735 Programmable Buffered Terminal
3600 Finance Communication System (see note)	3740 Data Entry System
3630 Plant Communication System (see note)	• 3780 Data Communications Terminal • 5100 Portable Computer
3650 Retail Store System	5110 Portable Computer
3680 Programmable Store System	5230 Data Collection System
3730 Distributed Office Communication System	5260 Retail System
3767 Communication Terminal (see note)	Communicating Magnetic Card
3770 Data Communication System (see note)	Selectric Typewriter (CMCST)
3790 Communication System	Office System/6
4300 Processors (see note)	Series/1
4700 Finance Communication System (see note)	System/3
5280 Distributed Data System (see note)	System/7
5520 Administrative System (see note)	System/23
5550 Administrative System (see note)	---
5937 Rugged Terminal (see note)	---
6670 Information Distributor (see note)	---
8100 Information System (see note)	---

Table 7 (Page 2 of 2). Supported system and device types	
Direct connection to CICS using VTAM	**Connection using transaction routing through CICS for VSE/ESA Version 2.3 (BTAM terminals)**
8775 Display Terminal	---
8815 Scanmaster	---
Displaywriter (see note)	---
Personal Computer, PS/2, PS/55 (see note)	---
System/32 (see note)	---
System/34 (see note)	---
System/36™ (see note)	---
System/38™ (see note)	---
AS/400	---
System/370™ (including 303x, 308x, and 3090™ processors) (see note)	---
Teletypewriter Exchange Service (TWX 33/35) (see note)	---
World Trade Typewriter Terminal (WTTY) (see note)	---
Note: These terminals are also supported by BTAM on CICS for VSE/ESA Version 2.3.	

Software requirements

Use the following sections to verify that you have the appropriate software to run CICS:

- Access methods
- Database products
- Programming languages
- Intersystem communication (ISC) and multiregion operation (MRO)

Access methods

CICS requires the access methods shown in Table 8.

Table 8. Release information for access methods supported in CICS TS Release 1		
Product	**Release number**	**Program number**
VSE/VSAM	Mandatory. Supplied in VSE/ESA V2.4 as part of the Central Functions component.	5686-037
VTAM	Version 4 Release 2. Supplied as a VSE/ESA V2.4 base program.	5686-065

CICS does not support BTAM networks. Consider adopting a coexistence strategy if you cannot migrate your BTAM networks to VTAM. BTAM/ES Version 1 Release 1 is available as a VSE/ESA Version 2 Release 4 optional program. See

Database products

CICS runs with the optional IBM database products listed in Table 9.

Table 9. Database products supported by CICS TS Release 1		
Product	**Release number**	**Program number**
DL/I VSE [1]	1.11	5746-XX1
DB2 for VSE/ESA [2]	6.0	5648-158
Notes:		
[1] DL/I VSE is the new name for DL/I DOS VS. DL/I DOS VS 1.10 is still available on the optional product tape, but works only with CICS for VSE/ESA Version 2.3 . DL/I VSE 1.11 does not work with CICS for VSE/ESA Version 2.3.		
[2] DB2 for VSE/ESA was previously known as SQL/DS™.		

(Table note: row marked "5" in margin beside DB2 for VSE/ESA.)

Programming languages

CICS supports only those application programs that use the CICS command-level application programming interface (API), written in the following languages:

- Assembler
- C
- COBOL
- PL/I

Macro-level application programs must be converted to command-level using the tools and services provided, such as DFHMSCAN and the CICS/AMA utility. Consider a coexistence strategy if full conversion is not possible.

CICS does not support RPG II application programs.

Assemblers and compilers

You can assemble or compile command-level applications programs using the assembler and compilers shown in Table 10.

Table 10 (Page 1 of 2). Languages and compilers supported by CICS			
Language	**Compiler**	**Release number**	**Product number**
Assembler	High-level assembler	1.10	5696-234
C	IBM C for VSE/ESA [1] [2]	1.1.0	5686-A01
COBOL	IBM COBOL for VSE/ESA [1] [3]	1.1.0	5686-068

Table 10 (Page 2 of 2). Languages and compilers supported by CICS			
Language	**Compiler**	**Release number**	**Product number**
PL/I	IBM PL/I for VSE/ESA **1** **4**	1.1.0	5686-069

Notes:

1 Language Environment® for VSE/ESA 1.4, program number 5686-094, is the required runtime environment for the supported high-level languages.

2 CICS does not support C application programs compiled with the C/370 compiler. C/370 application programs must be recompiled using the IBM C for VSE/ESA compiler.

3 CICS supports COBOL programs compiled with the DOS/VS COBOL and VS COBOL II compilers provided the programs are relinked using the LE libraries.

4 CICS does not support PL/I application programs compiled with the DOS PL/I compiler. DOS PL/I application programs must be recompiled using the IBM PL/I for VSE/ESA compiler.

ISC and MRO communication

CICS TS Release 1 supports intersystem communication (ISC) links with:

- Other CICS TS Release 1 systems
- CICS for VSE/ESA Version 2.3
- CICS Transaction Server for OS/390® Release 1
- CICS Transaction Server for OS/390 Release 2
- CICS Transaction Server for OS/390 Release 3
- CICS/ESA® Version 4 Release 1
- CICS on Open Systems
- CICS for OS/2®
- Transaction Server for Windows NT Version 4
- CICS/400®
- CICS/VM™
- IMS/ESA® Version 5 Release 1
- IMS/ESA Version 6 Release 1
- Any system that supports **Advanced Program-to-Program Communication** (APPC) protocols (LU6.2).

CICS TS Release 1 supports multiregion operation (MRO) for communication with:

- Other CICS TS Release 1 systems
- CICS for VSE/ESA 2.3 systems

Migration Paths

Single-step migration

If your current CICS regions run under CICS for VSE/ESA Version 2.3, you can migrate in one step. If your CICS regions are at an earlier release level, you must first migrate from that level to CICS for VSE/ESA Version 2.3. See the *CICS for VSE/ESA Version 2.3 Release Guide* for information about the functional content of CICS for VSE/ESA Version 2.3.

Multiple-step migration

If you migrate your CICS regions in more than one step, ensure that your applications and program packages work with any intermediate releases of CICS before you complete your migration. When you are satisfied that your intermediate CICS for VSE/ESA Version 2.3 system is working correctly, you can begin migrating.

When migrating from CICS for VSE/ESA Version 2.3 you can use MRO to communicate between regions at the different release levels. Full migration can then be phased in gradually.

Note: MRO connections between CICS regions at different release levels are supported only by CICS for VSE/ESA Version 2.3 and CICS TS Release 1.

You can also use ISC to connect to any CICS/VSE Version 2 system. The level of function provided on any connection is that of the earlier release involved in the connection. The earlier release can be running under any operating system or in any special package which is supported by that release of CICS.

For migration considerations for MRO and ISC, see Chapter 6, "Multiregion operation (MRO)" on page 27 and Chapter 9, "Intersystem communication (ISC)" on page 41.

Using the external CICS interface

The CICS external interface (EXCI) can be used directly only with a CICS TS
\# Release 1 region. If you coexist with CICS for VSE/ESA Version 2.3, you can use
\# EXCI to communicate with your CICS for VSE/ESA Version 2.3 system by
\# daisy-chaining DPL requests through a CICS TS Release 1 region.

Using the Data Management Facility (DMF) Data Handler

All monitoring and statistics information is written in SMF-format to Data Management Facility (DMF) data sets. If you coexist with CICS for VSE/ESA Version 2.3, you cannot send monitoring and statistics information from your CICS for VSE/ESA Version 2.3 system to DMF. You must continue using CICS for VSE/ESA Version 2.3 facilities.

Migrating CICS with XRF

Use the CICS extended recovery facility (XRF) if you need to provide higher system availability. XRF does not prevent failures, but minimizes the duration of particular types of outage arising from processor, VSE, or VTAM failure, as well as CICS failure.

However, you cannot run an XRF system comprising an active CICS system and an alternate CICS system at different CICS release levels. That is, an active CICS system running under CICS for VSE/ESA Version 2.3 cannot have an alternate CICS system running under CICS TS Release 1, nor can a CICS TS Release 1 active have a CICS for VSE/ESA Version 2.3 alternate.

If the active and alternate CICS regions are running in different VSE images, shared DASD volumes are needed for:

- Some CICS data sets
- VSE/POWER shared spool

- Application data sets

See the *CICS System Definition Guide* for more information about system data sets.

Migrating CICS with GDDM

If you use the IBM Graphical Data Display Manager (GDDM) with your CICS applications, you need GDDM Version 3 Release 2 to run GDDM applications. All CICS applications must be relinked with the GDDM 3.2 stubs.

Migrating CICS with third-party software products

In addition to the prerequisite products or products that directly support your use of a CICS system, there are many other pieces of software that can be used with CICS. Before migrating, make sure that the CICS-related products you use are able to run with the new release, and that any PPT and PCT entries these products require are available as CSD definitions. If the products you use cannot run under CICS TS Release 1, ask your suppliers for modified or replacement versions.

Migration planning summary

In summary, how you migrate your system depends on your current level of CICS, and the associated products you are already using.

The key points to remember are:

- Make sure you have the requisite software levels for the functions you wish to use.

- Make sure you have the requisite hardware for the functions you wish to use.

- If you are migrating from a release of CICS earlier than CICS for VSE/ESA Version 2.3, you should migrate to CICS for VSE/ESA Version 2.3 first.

- If you have a CICS for VSE/ESA Version 2.3 system coexisting with a CICS TS Release 1 system, you cannot send statistics and monitoring data produced by your CICS for VSE/ESA Version 2.3 system to DMF. CICS for VSE/ESA Version 2.3 data needs to be processed using CICS for VSE/ESA Version 2.3 methods.

- You cannot run an XRF system comprising an active CICS system and an alternate CICS system at different release levels of CICS.

- All CICS GDDM applications must be relinked with the GDDM 3.2 stubs to work properly on CICS TS Release 1.

- Ensure that all third-party products you use are capable of running under CICS TS Release 1. If they are not, you must obtain replacement products.

Chapter 4. Installing CICS

CICS is installed as part of the base installation process for VSE/ESA Version 2 Release 4. The allocation of the product libraries and the restoration of the product code is controlled automatically by this process. Thereafter, CICS is used by the VSE/ESA Interactive Interface (II) for subsequent system installation steps.

Fast Service Upgrade (FSU)

Because of the extensive changes made in VSE/ESA 2.4 and CICS TS Release 1 a fast service upgrade (FSU) cannot be offered. A full base and optional product installation is required.

Before you install CICS Transaction Server for VSE/ESA Release 1

Consider the following points before attempting to install CICS.

Applying supplementary PTFs and APARs

You may have to apply additional program temporary fixes (PTFs) and authorized program analysis reports (APARs) if CICS is to run successfully. Documentation about PTFs and APARs can be found in the RETAIN preventive service planning (PSP) buckets, in program directories and in updated product publications (usually on CD ROM). Your IBM support center can help you identify these additional sources of information.

Other considerations

To ensure that your migration goes smoothly and that you do not duplicate work, consider doing the following on your current CICS:

4
4
4
2
2

- Implement RDO to get as much experience of using RDO as possible before migrating, when RDO becomes mandatory for defining programs, transactions, and terminals. Facilities are provided to migrate table definitions to RDO. If you are using a standard VSE/ESA Version 2 system, you already have an existing CSD, which you should use for your own resource definitions.

- Use autoinstall for your VTAM terminals.

- Use the CExx transactions instead of CSxx. For example, use CEMT instead of CSMT, because the CSxx transactions are no longer supported.

- Prepare for the possibility of a coexistence environment by implementing MRO. This allows you to gain experience of MRO before you migrate.

VSE shared virtual area (SVA) considerations

Some modules must reside in the shared virtual area (SVA). These are summarized in Table 11.

Table 11. Mandatory SVA modules	
Module	**Description**
DFHCDDAN	The CPC dead-data anchor-block DFHCDDAN must be loaded into the SVA in a dual-CPC XRF environment. Although DFHCDDAN is not read-only, it must still be placed in the SVA.
DFHCSEOT	CICS EOJ cleanup routine. Performs cleanup for MRO and shared data tables. VSE invokes DFHCSEOT during its end-of-job processing. If it cannot find DFHCSEOT in the SVA, cleanup does not take place and the interregion environment becomes unusable. **2**
DFHCSVC	CICS SVC. **1** **2**
DFHDSPEX	The CICS post exit stub. DFHDSPEX is part of the new CICS dispatcher mechanism and is included in the SDL load provided by VSE/ESA Version 2 Release 4. It must not be deleted. **1**
DFHDTSAN	Shared data tables (SDT) services module
DFHDTSVC	Shared data tables system anchor block. If you are using shared data tables support, DFHDTSAN provides an anchor for SDT control blocks. Although DFHDTSAN is not read-only, it must still be included in the SVA.
DFHIRP and DFHIRW10	Interregion communication programs. If you are using MRO, DFHIRP and DFHIRW10 must be used from the SVA for integrity reasons. **2**
DFHSCTE	Subsystem control table extension. If you are using MRO, DFHSCTE provides an anchor for the interregion communication control block structure. Although DFHSCTE is not read-only, it must still be placed in the SVA. **2**

Notes for Table 11:

1 This module must be installed in the SVA before CICS can be started regardless of which CICS facilities are used. The new structure of CICS invokes key functions using special supervisory support provided by module DFHCSVC. Therefore DFHCSVC must reside in the VSE shared virtual area (SVA). DFHCSVC is included in the system directory list (SDL) job provided by VSE/ESA for startup. If you make any changes to the SDL, ensure that it continues to include DFHCSVC together with any other mandatory phases.

2 To communicate using MRO, all CICS regions in the same VSE image must use the latest levels of the modules DFHCSVC, DFHCSEOT, DFHSCTE, and DFHIRP in the SVA. If, when opening interregion communication (IRC), a CICS region detects that the level of DFHIRP being used is a lower level version, it issues message DFHIR3799 and IRC fails to open.

For more information about the SVA and module eligibility, see the *CICS System Definition Guide*.

Installing CICS for VSE/ESA Version 2.3 using the VSE/ESA Interactive Interface

If you need to run in coexistence mode, you can install a CICS for VSE/ESA Version 2.3 system using the VSE/ESA Interactive Interface (II).

MRO connections between CICS regions a different release levels allow the older terminal networks to access applications and data on the later CICS regions; conversely, terminals connected to the new CICS have access to non-migrated applications on the old system.

The CICS for VSE/ESA Version 2.3 support provided with the VSE/ESA 2.4 system package includes the definition of the CICS for VSE/ESA Version 2.3 libraries, the restoration of the product code, and the ability to define appropriate connections between the systems using skeleton JCL.

More information about this and the other VSE installation processes is given in the *VSE/ESA Installation* manual.

Migration planning summary

In summary, CICS is installed as part of the base installation for VSE/ESA 2.4.

The key points to remember are:

- There is no FSU; a full base installation is required.
- Research and apply any prerequisite PTFs and APARs. Contact your IBM support center if you need help.
- Try to get as much experience of RDO as you can before you migrate. Defining programs, transactions, and terminals using RDO is mandatory.
- Try to get experience of using MRO before migrating. This is especially important if you have to develop a coexistence strategy.
- Take special note of the SVA considerations listed in this chapter and in the *CICS System Definition Guide*.

2
- Use CICS for VSE 2.3 as your coexistence platform.

Chapter 5. System generation (SYSGEN)

You no longer need to use the system generation (DFHSG) macros for CICS because:

- More CICS components are supplied in standard, pregenerated form.

- The scope for using resource definition options and system initialization parameters is increased.

Review your use of system generation options in your current release of CICS and, where appropriate, use alternative methods (for example, system initialization parameters) to achieve the same result. Far fewer modules are *source-serviced*. The majority of CICS code is now *object-serviced*. The exceptions to this are the CICS-supplied copybooks, sample programs, and tables. Furthermore, the majority of CICS modules are provided as object-code only (OCO); that is, the source is **not** available on the optional source tape.

If you have modified CICS management module source code in the past, also review these modifications and implement the functions they provide using a global user exit program and the exit programming interface (XPI).

See the *CICS Customization Guide* for more information about the XPI.

Effects on terminal control

Note the points regarding the terminal control programs:

ISC support
> ISC support is included as standard in the pregenerated versions of terminal control programs.

DFHTCP
> You cannot modify and generate your own version of the terminal control program, DFHTCP. It is a full-function module and cannot be suffixed. DFHTCP contains support for the functions previously supplied in the suffixed version of module DFHTCPS$, with the exception of:
>
> - Local BTAM functions
>
> - The option to request CICS to protect an application from receiving unsolicited output by use of the PUNSOL parameter. The CICS TS Release 1 version of DFHTCP implies PUNSOL=NO. The exception to this is on RECEIVE commands that specify the BUFFER option. These commands continue to be protected from unsolicited input. For more information about the PUNSOL parameter, see the *CICS System Definition Guide* and the *CICS Application Programming Guide*.

SAM support
> SAM support is included as standard in the pregenerated version of DFHTCP.

BTAM terminals
> CICS only supports BTAM terminals that are defined as remote terminals for the purpose of transaction routing. All other support for BTAM is withdrawn.

ZCP modules
  The ZCP modules DFHZCB, DFHZCX, and DFHZCZ cannot be suffixed.

ZCx modules
  You cannot generate the ZCx modules; you must use the pregenerated versions supplied with CICS. They include all the features you previously had to specify using SYSGEN options.

3 # Effects on user-replaceable programs

3
3 The user-replaceable program DFHRTY is replaced by DFHREST. Review your user-replaceable programs and modify them appropriately. See "Changes to user-replaceable programs" on page 151 for more information.

Migration planning summary

In summary, system generation facilities are obsolete, because more CICS components are supplied in standard, pregenerated format, and because the scope of RDO options and system initialization parameters are extended.

The key points to remember are:

- ISC support is included as standard in the pregenerated versions of terminal control programs.

- You cannot modify or generate your own version of DFHTCP.

- SAM support is included as standard in the pregenerated version of DFHTCP.

- BTAM terminals are supported only if they are defined as remote, for the purpose of transaction routing.

- The ZCP modules cannot be suffixed.

- DFHRTY is replaced by DFHREST. Review your user-replaceable programs and modify them accordingly.

Part 2. Communicating between different CICS systems

Table 12. Intercommunication road map	
If you want to...	**Refer to...**
Migrate from a single-region CICS system	"Migrating from a single-region CICS system" on page 30
Migrate in an MRO/ISC environment	"Migrating in an MRO/ISC environment" on page 34
Migrate from a multiple-region CICS system	"Migrating from a multiregion environment" on page 36
Know how to migrate to the latest level of the interregion communication program, DFHIRP	"Migrating to the CICS Transaction Server for VSE/ESA Release 1 DFHIRP" on page 27
Learn about parallel running environments	Chapter 8, "Parallel running" on page 39
See summaries of the changes made to the CICS implementation of LU6.2	"Changes to CICS implementation of APPC (LU6.2)" on page 41

Chapter 6. Multiregion operation (MRO)

CICS supports MRO links with CICS for VSE/ESA Version 2.3.

During the migration period, you may need to have two CICS regions at different release levels communicating with each other. To do this:

- Install the latest interregion communication program DFHIRP, and other madatory modules, in the SVA. See Table 11 on page 20 for more information.

- Ensure that only CICS for VSE/ESA Version 2.3 is using the SVA for other modules. For more information, refer to "Common module names in a coexistence environment" on page 29.

These steps ensure that regions can communicate successfully, at the level of function of the earlier release.

Migrating to the CICS Transaction Server for VSE/ESA Release 1 DFHIRP

The DFHIRP program is always downward compatible with previous releases.

The following steps are a guide to migrating to MRO, with the latest versions of the MRO modules installed in the SVA.

1. Install MRO support
Install the latest versions of DFHIRP, DFHIRW10, DFHSCTE, and DFHCSEOT in the SVA.

2. Test current production release
Test your production MRO CICS regions, under your existing release of CICS, but using the new versions of DFHIRP, DFHSCTE, and DFHCSEOT.

3. Cutover to production with the new IRP
If the production MRO regions successfully logon to the new IRP, use the new DFHIRP, DFHSCTE, and DFHCSEOT for the production systems.

4. Test MRO with CICS TS Release 1 regions
With the production regions running successfully under the latest version of DFHIRP, you can initialize and test some CICS TS Release 1 regions using MRO. These test regions can coexist in the same VSE image as the production regions, all using the same version of DFHIRP.

Security considerations

The steps you take to migrate to MRO with logon and bind-time security checking depends on your ESM.

SECURITYNAME obsolete

The SECURITYNAME parameter on the MRO CONNECTION resource definition is obsolete, and the internal CICS MRO bind-time security check is replaced by two new MRO security checks. These both involve calls to the ESM, the first for logon to IRP, and the second for the bind to the partner CICS.

These security checks require DFHAPPL.*applid* profile definitions in the ESM FACILITY general resource class, if supported by your ESM.

Note: These definitions are identical to those needed for bind-time security when using CICS shared data tables support. See the *CICS Shared Data Tables Guide* for information about the security requirements for shared data tables.

You do not need to remove the SECURITYNAME operand from your MRO connection definitions—they are ignored by CICS.

You should review your use of the SECURITYNAME parameter on all regions that are communicating through MRO links using the CICS TS Release 1 version of DFHIRP. If you do not want to use IRP logon or bind-time security, do not define any DFHAPPL definitions. If the required profiles are not found, the logon and bind security checks succeed.

Link security

Link security is also affected by the SECURITYNAME parameter being obsolete. Link security is controlled either by the link user ID specified on the MRO SESSIONS definition, or by the CICS region user IDs that are used for bind-time security checking.

For information about link security, see "Changes to MRO link security" on page 175.

DFHACEE obsolete

The user-replaceable MRO security identification program, DFHACEE, is withdrawn. DFHACEE is replaced by a customizable VSE/ESA security router exit, ICHRTX00, which is part of the SAF interface.

Migration planning summary

In summary, CICS supports MRO links with CICS for VSE/ESA Version 2.3.

The key points to remember are:

• The latest version of DFHIRP is downwardly compatible.

• The latest version of DFHIRP must reside in the SVA.

Chapter 7. Coexistence strategies

If you cannot migrate your CICS production regions in their entirety, you may have to devise a strategy that allows you to migrate as much as possible, leaving behind only those applications that cannot be migrated because of an incompatibility. For example, you may have some macro-level assembler, RPG, C/370, or DOS PL/I command-level application programs that cannot be supported. Macro-level application programs can continue to run in a CICS for VSE/ESA Version 2.3 region, sharing data that is owned by the CICS for VSE/ESA Version 2.3 region with a CICS TS Release 1 region.

This chapter outlines ways in which a CICS for VSE/ESA Version 2.3 system can coexist with migrated regions using multiregion operation (MRO).

> **Note**
>
> The term *region* is used in this chapter. In this context, region is equivalent to a VSE/ESA partition.

Common module names in a coexistence environment

If you need to run a coexistence environment, you will find that many of the modules in the restructured CICS have the same names as modules in CICS for VSE/ESA Version 2.3. The content of these modules, however, is very different. Therefore, with the exception of the mandatory modules described in Table 11 on page 20, modules with common names must not be placed in the SVA, even if they are eligible for inclusion. If you include such a module, unpredictable problems can occur for one or both CICS releases.

To prevent a module with a common name being used from the SVA, you can:

1. Specify SVA=NO as a system initialization parameter for any CICS Transaction Server for VSE/ESA Release 1 region. With the exception of the mandatory SVA modules, SVA=NO stops any CICS management modules being used by CICS TS from the SVA or extended SVA. Each region uses copies of the modules that are loaded privately.

2. Specify, on the PRVMOD system initialization parameter for any CICS TS region, the module names that cannot be shared. By doing this, you can share those SVA-eligible modules that do not have CICS for VSE/ESA Version 2.3 equivalents. The modules that cannot be shared are listed in the sample source member, DFH$SVEX.J, which is supplied in the VSE/ESA sublibrary, PRD1.BASE. DFH$SVEX contains a long list of modules, but if you want to use it, include the following POWER source library (SLI) statement in your CICS startup JCL in the system initialization parameters:

   ```
   * $$ SLI MEM=DFH$SVEX.J,S=PRD1.BASE
   ```

   To read the system initialization parameters from the startup job, the `EXEC DFHSIP,...` statement must include, `PARM='SI'`. Without this, CICS does not attempt to read the override parameters. Also specify SVA=YES as a system initialization parameter. This is required for the PRVMOD keyword to have effect.

By using one of these methods, you can safely place CICS for VSE/ESA Version 2.3 modules into the SVA. You can remove the system initialization parameters when you no longer need to run in a coexistence environment.

Migrating from a single-region CICS system

If you are running a single region CICS system that has elements that cannot easily be migrated, consider adopting an MRO solution that allows you to route transactions from your CICS for VSE/ESA Version 2.3 region. For example, your existing CICS could comprise some or all of the following components:

VTAM terminals

These present no difficulty, and their resource definitions can be migrated. If they are defined in a terminal control table (TCT), migrate the table definitions to the CSD as recommended in the *CICS Resource Definition Guide*. If you are already using the CSD for VTAM terminal definitions, either as explicitly defined terminals or as autoinstall model definitions, you can continue using these unchanged.

BTAM terminals

These are not supported, except as remote terminals for ISC/MRO purposes and cannot be installed as locally-attached devices. To support transaction routing from the CICS for VSE/ESA Version 2.3 region that owns the BTAM terminals, generate a TCT that specifies the BTAM terminals as remote terminals. You can use the existing DFHTCT TYPE=TERMINAL source macro instructions for the BTAM terminals to generate the new TCT by including a DFHTCT TYPE=REGION macro. This must precede the DFHTCT TYPE=TERMINAL instructions. See the *CICS Resource Definition Guide* for more information about generating a TCT for remote terminal definitions.

Command-level applications

Depending on the compiler used, command-level programs are fully supported and can be migrated, as follows:

- All command-level application programs compiled using an LE-conforming compiler can be migrated unchanged.

- Application programs compiled by the C/370 and DOS PL/I compilers are not supported, and need to be recompiled using the appropriate LE-conforming compiler for the language.

- The DOS/VS COBOL and VS COBOL II compilers are no longer supported products, although application programs compiled with these compilers should continue to work under CICS as in earlier releases. To run your old COBOL application programs compiled by the DOS/VS COBOL or VS COBOL II compilers, and ensure they are eligible for support, relink them using the LE libraries.

- RPG is no longer a supported language.

If the command-level programs access files that are also used by macro-level applications, leave the files on your CICS for VSE/ESA Version 2.3 region and define them as remote files on the CICS TS Release 1 region. The files are accessed by function-shipping the file requests.

Macro-level applications
> These are not supported. Where possible, convert macro-level
> application programs to command-level and migrate them as described
> above. Macro-level applications that cannot be converted to
> command-level have to remain on your CICS for VSE/ESA Version 2.3
> system.

VSAM and DAM files, transient data and temporary storage queues
> The resource definitions for these resources should be reviewed, and
> installed as required on the CICS for VSE/ESA Version 2.3 region, on
> the CICS TS Release 1 region, or on both.
>
> See the *CICS Application Migration Aid Guide* for more information
> about converting macro-level application programs to command level.

If you decide to use MRO as recommended, specify the required CONNECTION
and SESSIONS resource definitions in the CSD.

Example of a single-version CICS system

Figure 1 illustrates the single-region CICS system described above.

```
A single-region CICS for VSE/ESA 2.3 system

Terminals:

 VTAM - Migrate these to CICS TS for VSE/ESA

 BTAM - Unsupported by CICS TS for VSE/ESA


Applications:

 Command-level - Migrate to CICS TS for VSE/ESA
                 (except for C/370, RPG & DOS PL/I

 Macro-level  - Unsupported by CICS TS for VSE/ESA


VSAM and DAM files, TD and TS queues

     Migrate those resources that are associated
     with CICS TS for VSE/ESA command-level
     application programs only.
```

Figure 1. A CICS for VSE/ESA Version 2.3 single-region CICS

Single-region migration – option 1

Figure 2 on page 32 illustrates CICS regions running under CICS for VSE/ESA
Version 2.3 and CICS TS Release 1 after you have migrated the elements of your
current CICS region that can be migrated. The macro-level applications that
remain on the CICS for VSE/ESA Version 2.3 system can be in any language. The
numbers in parentheses in Figure 2 refer to the notes that follow.

```
┌─────────────────────────┐        Transaction Route (1)        ┌─────────────────────────┐
│      CICS/VSE 2.3       │─────────────────────────────┐      │    CICS TS for VSE/ESA  │
├─────────────────────────┤                             │      ├─────────────────────────┤
│      Terminals:         │                          ┌──┼──────│      Terminals:         │
│                         │                          │  │      │                         │
│        BTAM             │                          │  │      │        VTAM             │
│                         │                          │  │      │                         │
│                         │                          │  │      │                         │
├─────────────────────────┤   Transaction Route (2)  │  │      ├─────────────────────────┤
│      Applications:      │◄─────────────────────────┼──┘      │      Applications:      │
│                         │                          │         │            │            │
│    Macro-level only     │                          │         │   Command-level only    │
│         │               │                          │         │            │            │
│         │               │                          │         │          (4)            │
│         ▼               │                          │         │            ▼            │
├─────────────────────────┤                          │         ├─────────────────────────┤
│      Resources:         │                          │         │      Resources:         │
│                         │    Function ship (3)     │         │                         │
│  VSAM and DAM files     │◄─────────────────────────┘         │  VSAM and DAM files     │
│  TD and TS queues       │                                    │  TD and TS queues       │
│  for macro-level        │                                    │  for command-level      │
│  (and possibly some     │                                    │  applications only      │
│   command-level)        │                                    │                         │
│   applications          │                                    │                         │
└─────────────────────────┘                                    └─────────────────────────┘
```
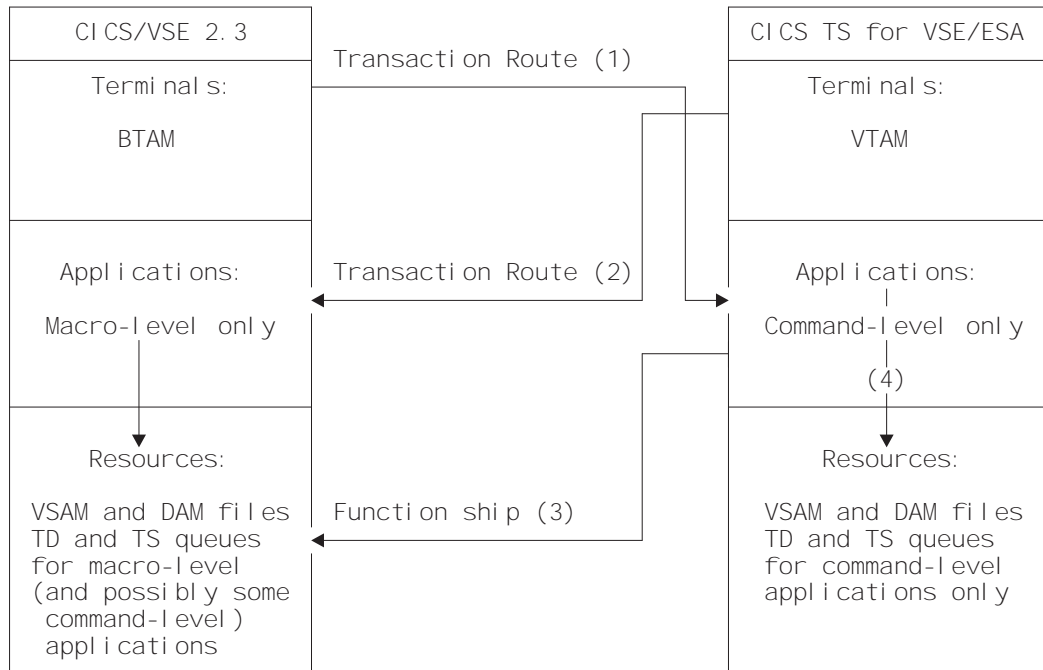
Figure 2. Migrating from a single region using MRO – option 1

Notes:

1. Transactions entered at BTAM terminals for applications that you have
   migrated are routed to the migrated region. For this purpose, define the
   transactions as remote transactions to the CICS for VSE/ESA Version 2.3
   region, and include remote BTAM terminal definitions in the TCT on the CICS
   TS Release 1 region. See the *CICS Resource Definition Guide* for information
   about defining remote terminals.

2. Transactions entered at VTAM terminals for applications that you have not
   migrated are routed to the CICS for VSE/ESA Version 2.3 region. For this
   purpose, define the transactions as remote transactions to the CICS TS
   Release 1 region. The CICS for VSE/ESA Version 2.3 region requires remote
   terminal definitions. The easiest way to achieve this is by defining your
   TYPETERMs in the upgraded CSD as shippable terminal definitions.

3. CICS does not support function shipping for macro-level requests. Therefore
   any resources that are accessed by macro-level applications must continue to
   be owned by the CICS for VSE/ESA Version 2.3 region. However, CICS does
   support function shipping for command-level requests. Therefore any
   applications that you migrate can still access the resources that are owned by
   the CICS for VSE/ESA Version 2.3 region. For this purpose, define the file
   resources to the CICS TS Release 1 region as remote files. See the *CICS
   Resource Definition Guide* for information about defining remote files (VSAM or
   DAM – CICS does not distinguish between remote files). See the *CICS
   Resource Definition Guide* for information about defining remote transient data
   and temporary storage queues.

4. CICS no longer supports C or PL/I application programs compiled by the C/370
   or DOS PL/I compilers. You can either leave these on the CICS for VSE/ESA
   Version 2.3 region, or recompile them using the appropriate LE-conforming
   compiler (IBM C for VSE/ESA or IBM PL/I for VSE/ESA).

If you have COBOL command-level application programs compiled using the DOS/VS COBOL or VS COBOL II compilers, relink these using the LE libraries.

CICS no longer supports the RPG program language.

Single region migration – option 2

As an alternative to running the two regions with their mixture of transaction routing and function shipping between the two regions described above, you can create a third region. In this case, all the data files are owned by a single CICS region running at CICS for VSE/ESA Version 2.3 level. The DOR[1] also supports macro-level applications. The other two regions support the two types of networks, TP access methods, or both. The three regions are described as follows:

TOR – BTAM This region, at the CICS for VSE/ESA Version 2.3 level, supports all the BTAM terminals that cannot be migrated to the CICS TS Release 1 region.

TOR/AOR – VTAM and command-level application programs
This CICS TS Release 1 region supports all the migrated VTAM terminals and the migrated command-level applications.

AOR/DOR – VSAM files and macro-level application programs
This region, at the CICS for VSE/ESA Version 2.3 level, supports all the macro-level applications, and all the VSAM files that are accessed by both the macro- and command-level applications.

Figure 3 illustrates this alternative option. The numbers in parentheses refer to the notes that follow.
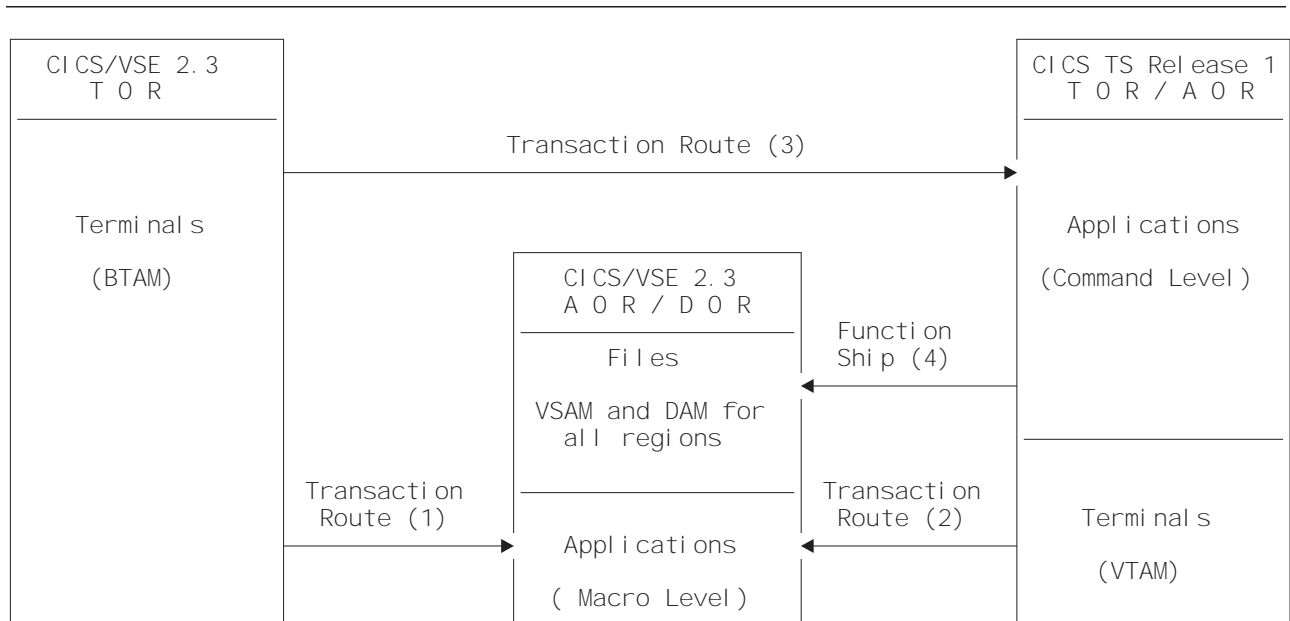
Figure 3. Migrating from a single region to CICS TS Release 1 using MRO - option 2

---

[1] A data-owning region (DOR) is a CICS address space whose primary purpose is to manage files and databases.

If you are running CICS with XRF, this configuration offers a better solution than option 1, shown in Figure 2 on page 32.

Notes:

1. Transactions entered at BTAM terminals for the macro-level applications are routed to the CICS for VSE/ESA Version 2.3 application-owning region (which is also the data-owning region).

2. Transactions entered at VTAM terminals for the macro-level applications, or the C/370, RPG or DOS PL/I command-level applications, are routed to the CICS for VSE/ESA Version 2.3 application-owning region (which is also the data-owning region).

3. Transactions entered at BTAM terminals for the command-level applications are routed to the CICS TS Release 1 region.

4. Transactions entered at any terminal for the command-level applications are processed in the CICS TS Release 1 TOR/AOR, but file requests are function-shipped to the CICS for VSE/ESA Version 2.3 DOR.

Migrating in an MRO/ISC environment

If you are running multiregion CICS systems, using either intersystem communication (ISC) or interregion communication (IRC) facilities, and you have elements that cannot easily be migrated, coexistence solutions are more complex than those already discussed for migrating from a single CICS region. You have to introduce CICS TS Release 1 regions into your ISC/MRO operations in a way that allows you to continue using your CICS for VSE/ESA Version 2.3 region for the elements that cannot be migrated. For example, your existing regions may comprise some or all of the following components:

VTAM terminals

These present no difficulty, and their resource definitions can be migrated in the same way as from a single-region CICS environment (see page 30).

BTAM terminals

These are not supported (except as remote terminals for ISC/MRO purposes), and cannot be installed as locally-attached devices. You need to maintain a BTAM terminal-owning region (TOR) for your BTAM network, and route transactions to a CICS TS Release 1 application-owning region (AOR) as appropriate. (See page 30 for more details.)

Command-level applications

Depending on the compiler used, command-level programs are fully supported and can be migrated, as follows:

- All command-level applciation programs compiled using an LE-conforming compiler can be migrated unchanged.

- Application programs compiled by the C/370 and DOS PL/I compilers are not supported, and need to be recompiled using the appropriate LE-conforming compiler for the language.

- COBOL application programs compiled by the DOS/VS COBOL and VS COBOL II compilers need to be relinked using the LE libraries.

- RPG is no longer a supported language.

If the command-level programs access files that are also used by macro-level applications, leave the files on your CICS for VSE/ESA Version 2.3 region and define them as remote files on the CICS TS Release 1 region. The files are accessed by function-shipping the file requests.

Macro-level applications

Macro-level application programs are not supported. Where possible you should convert macro-level application programs to command-level and migrate them as described above. Any macro-level applications that cannot be converted to command-level have to remain on your CICS for VSE/ESA Version 2.3 system.

VSAM and DAM files, transient data and temporary storage queues

Review the definitions for these resources and install them as required on your CICS for VSE/ESA Version 2.3 region, on your CICS TS Release 1 region, or on both.

A typical ISC/MRO configuration is illustrated in Figure 4.
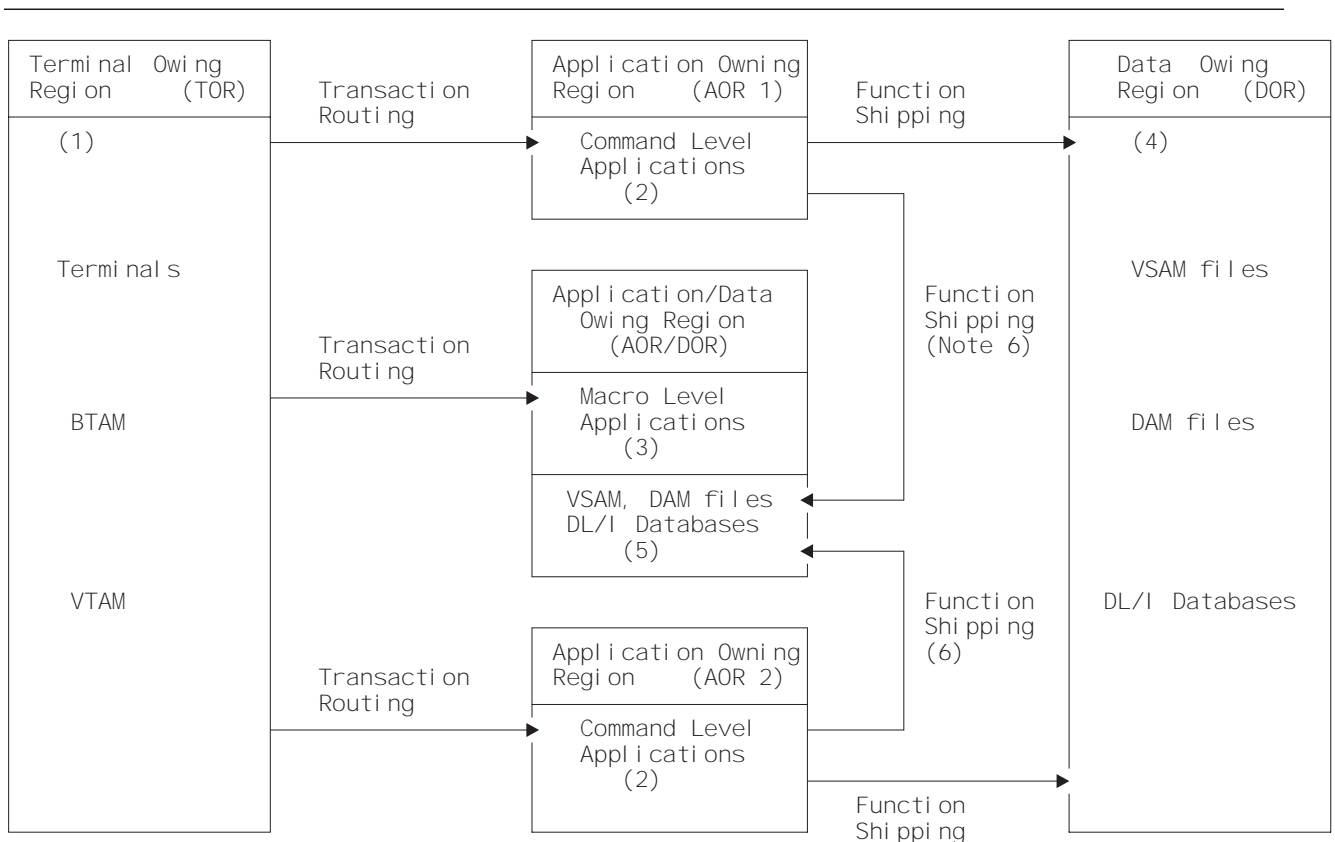
Figure 4. Possible ISC/MRO configuration using CICS for VSE/ESA Version 2.3

Notes:

1. The TOR provides support for both BTAM and VTAM terminals. All transactions are routed to application-owning regions.

2. AOR 1 and AOR 2 are essentially identical and provide support for command level applications which access data by function shipping to a DOR.

3. The AOR/DOR provides support for macro-level applications. Because macro-level applications cannot use function shipping, the data to which they require access is held in the same region. It is possible that command-level programs requiring access only to the local data would run here.

4. The DOR provides the support for data access using the function-shipped requests from AOR 1 and AOR 2.

5. The data managed by the AOR/DOR is different data from that held in the DOR.

6. These function-shipping connections allow the command-level applications running in AOR 1 and AOR 2 to access the data held locally in the macro-level AOR/DOR.

A simplified version of the complex just described is one where:

- The separate DOR does not exist
- **All** data is held in the AOR/DOR
- All requests from AOR 1 and AOR 2 are function-shipped to it

Migrating from a multiregion environment

Figure 5 on page 37 illustrates the MRO/ISC complex described in "Migrating in an MRO/ISC environment" on page 34 after migration. The majority of the regions are implemented with CICS TS Release 1.

```
                   REGIONS RUNNING AT CICS for VSE/ESA 2.3 LEVEL


  ┌─────────────────────┐                                      ┌─────────────────────┐
  │ Terminal  Owning    │                                      │ Application/Data    │
  │    Region           │                                      │   Owning Region     │
  ├─────────────────────┤         Transaction          ───────▶├─────────────────────┤
  │   Terminals         │─────────  Routing  ──────────        │   Macro Level       │
  │                     │                              ───────▶│   Applications      │
  │    (BTAM)           │                                      ├─────────────────────┤
  │                     │   Trans. Routing      Function Shipping│ VSAM and DAM files │
  │                     │─────────             ────────────────▶│  DL/I databases    │
  └─────────────────────┘                                      └─────────────────────┘


  ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─


  ┌─────────────────────┐                                      ┌─────────────────────┐
  │ Terminal  Owning    │                                      │ Data Owning         │
  │ Region       TOR2   │                                      │ Region       DOR1   │
  ├─────────────────────┤            ┌─────────────────────┐   ├─────────────────────┤
  │   Terminals         │            │ Application Owning   │──▶│ VSAM and DAM files │
  │                     │            │    Regions          │ Function│                │
  │    (VTAM)           │            │                     │ Shipping│  DL/I databases │
  │                     │ Transaction│                     │   │                     │
  │                     │──Routing──▶│                AOR1 │──▶│                     │
  │                     │            └─────────────────────┘   │                     │
  │                     │─────────────────────▶│        AOR2 │ │                     │
  └─────────────────────┘                      └─────────────┘ └─────────────────────┘


                   REGIONS RUNNING AT CICS TS FOR VSE/ESA R1 LEVEL
```

Figure 5. Migrating to CICS TS Release 1 from CICS for VSE/ESA Version 2.3 ISC/MRO systems

Notes:

1. The regions shown above the broken line are those which run under CICS for VSE/ESA Version 2.3; those below the line run with CICS TS Release 1.

2. There are two terminal-owning regions, one running under CICS for VSE/ESA Version 2.3 to support your BTAM networks, and the other running under CICS TS Release 1 supporting the VTAM terminals.

3. All command-level AORs (AOR1 and AOR2) are migrated, together with the DOR that owns the files used by command-level application programs.

4. You may need to redistribute the ownership of the files between the regions to enable the necessary support for function shipping. Function shipping is not supported for macro-level applications, therefore you must modify macro-level programs to use command-level requests if you want to use function shipping.

5. In the case where a separate DOR does not exist, you may have to add another CICS TS region if you want to maintain the performance advantages of local data for command-level application programs previously run in a single DOR/AOR.

Migration planning summary

In summary, if you cannot migrate your CICS production regions completely, develop a strategy that will allow you to migrate as much as possible, leaving behind only those applications that cannot be migrated because of an incompatibility.

The key points to remember are:

2
2
2

- Do not place any modules from CICS TS Release 1 into the SVA if they have modules of the same name in CICS for VSE/ESA Version 2.3, even if they are eligible for inclusion. If you do, unpredicatable results can occur.

- If you are running a single CICS region that has elements that cannot be migrated easily, consider using MRO so that you can route transactions from your current CICS system to CICS TS Release 1.

- If you are running multiregion CICS systems, using either ISC or IRC, and you have elements that cannot be migrated easily, phase in the introduction of CICS TS Release 1 regions into your communications network so as to avoid any detrimental effects on your CICS for VSE/ESA Version 2.3 regions containing the components that cannot be migrated.

Chapter 8. Parallel running

This chapter looks at running CICS systems in parallel with no intersystem communication set up (MRO or ISC).

XRF and parallel running

If you use CICS with XRF during the parallel running phase of your migration, ensure that the members of each XRF pair are at the same release level. For example, a CICS for VSE/ESA Version 2.3 active system cannot have a CICS TS Release 1 alternate system and a CICS TS Release 1 active cannot have a CICS for VSE/ESA Version 2.3 alternate.

The CSD and parallel running

4   After you have upgraded the CICS system definition (CSD) file, it can be shared by
4   CICS regions running under different releases. This allows for a transitional stage,
4   during which the releases share a common CSD. However, because some
4   resources have new attributes in CICS TS Release 1, always update the CSD
4   using the latest level of the CED*x* transaction or the DFHCSDUP utility.

CSD incompatibilities

CICS displays obsolete resource definition attributes on RDO panels as protected fields. This indicates that they are no longer supported. Modifying resource definitions containing obsolete attributes does not cause the loss of these attributes.

To update obsolete attributes that are shown as protected fields, enter compatibility mode by pressing the PF2 (COM) key to unprotect the fields.

CICS TS Release 1 is the first version of CICS on the VSE/ESA platform where the use of a CSD for resource definitions is mandatory. This makes the CSD a critical resource of your system. It is important that you familiarize yourself thoroughly with RDO before attempting to migrate. Implementing RDO on your current CICS regions is a good first step towards this familiarization.

If one of the sharing regions is using the default values for an attribute not supported by the other sharing region, it does not matter if that attribute is present or absent. The key point is that you must not use the ALTER command to change resource definitions when it could cause the loss of **non-default** values that you have specified. Plan and document a set of strict controls on the use of the CED*x* transactions and the DFHCSDUP utility, so that you can manage the maintenance of your resource definitions properly.

See the *CICS Resource Definition Guide* manual for more information about using the CEDA and CEDB ALTER commands to update resource definitions in compatibility mode.

You can also use compatibility mode with the CSD utility, DFHCSDUP, to update resources that specify obsolete attributes. You specify this on the PARM parameter of the EXEC DFHCSDUP statement, using the COMPAT option (NOCOMPAT is the default).

CICS-supplied compatibility groups

Because there are differences from the IBM-supplied definitions in CICS for VSE/ESA Version 2.3, you need to specify a different startup group list for the regions running under different releases.

When you upgrade the CSD using the UPGRADE command of DFHCSDUP, the old versions of CICS resource definitions are defined in compatibility groups (DFHCOMP*n*), which are needed to support earlier releases of CICS. Ensure the appropriate compatibility groups are included in the group list for startup of an earlier release.

For a description of the CICS-supplied compatibility groups, see "Compatibility groups" on page 90.

Operating CICS during parallel running

There are some planning and implementation considerations for the operation of different release levels of CICS.

Consider the possible effects on your operational procedures. Some areas are heavily affected by the differences from earlier release, such as:

- In initialization—messages, system initialization parameters, and initialization error recovery
- In messages and codes issued by different releases, and in the operator actions they require
- In handling output from CICS monitoring and statistics
- In handling output from CICS dump and trace
- In restart and recovery requirements
- In security administration.

Check the differences carefully when you plan the changes to your CICS operating procedures.

Migration planning summary

The key points to remember are:

- If you use CICS with XRF during the parallel running phase of your migration, ensure that the members of each XRF pair are at the same release level.
- If you are sharing the CSD between releases, update the CSD using the latest version of CED*x* or DFHCSDUP.
- CICS TS is the first version on the VSE platform where the CSD is mandatory for resource definitions.

Chapter 9. Intersystem communication (ISC)

CICS regions can connect to other regions using intersystem communication (ISC) or multiregion operation (MRO) facilities. The function available is at the level of the lower release involved in the connection.

A lower-level release connected using ISC can be running under any operating system or as part of any special package that is supported by that release of CICS.

CICS systems can also be connected to some non-CICS systems using ISC. CICS TS Release 1 supports ISC links with:

4
4
4
4
4
4
4
4
4
4
4
4
4
4
4

- Other CICS TS Release 1 systems
- CICS for VSE/ESA Version 2.3
- CICS Transaction Server for OS/390 Release 1
- CICS Transaction Server for OS/390 Release 2
- CICS Transaction Server for OS/390 Release 3
- CICS/ESA Version 4 Release 1
- CICS on Open Systems
- CICS for OS/2
- Transaction Server for Windows NT Version 4
- CICS/400
- CICS/VM
- IMS/ESA Version 5 Release 1
- IMS/ESA Version 6 Release 1
- Any system that supports **Advanced Program-to-Program Communication** (APPC) protocols (LU6.2).

Multiple connections between CICS systems

You can have only one APPC connection between two CICS regions, and you cannot have both an APPC and an LUTYPE6.1 connection between the two regions. In earlier releases, CICS does not prevent you installing these invalid combinations of connection, but now the installation of invalid connections fails.

Changes to CICS implementation of APPC (LU6.2)

If you have any distributed transaction processing (DTP) applications that use CICS APPC commands, changes to the CICS implementation of the APPC architecture could require changes to the APPC programs before you can migrate them.

Table 13. Summary of CICS APPC (LU6.2) implementation changes	
Summary of change	**Type of applications affected**
Timely receipt of responses (to SENDs)	Mapped and unmapped
Removal of deferred data	Mapped
Negative response to SYNCPOINT	Mapped and unmapped
Two adjacent syncpoints	Mapped
Conversation state after rollback	Mapped and unmapped (and MRO)
New conversation state option	Mapped and unmapped (and MRO)
Return data and status on RECEIVE	Mapped and unmapped
PROCNAME extended to 64 characters	Mapped and unmapped
Backout Required condition change	Mapped and unmapped (and MRO)

Timely receipt of responses

This change provides a solution to the situation in which an application front-end transaction issues a series of send requests that the back-end transaction attempts to interrupt by issuing an error command (using ISSUE ERROR). In earlier releases, CICS buffers send commands, and if the negative response (ISSUE ERROR) crosses the SENDs, the front-end transaction may not know about the error until some time after it is issued by its partner. This results in the front-end transaction continuing to issue send requests without being aware of the error response. The solution adopted ensures that front-end transactions receive responses even when CICS is buffering the SENDs.

Applications issuing consecutive send requests can now receive responses (negative or signal) earlier than on earlier releases. Providing your existing applications are written according to the guidelines and recommendations contained in the *CICS Distributed Transaction Programming Guide*, this change should not affect them.

Removal of deferred data

For mapped conversations, earlier releases of CICS use a system of *deferred data* on send requests, so that any data flow control (DFC) indicators in the next request can be "piggy-backed" on the earlier request. In some circumstances, CICS sends null data with the DFC indicators, using a null GDS ID of X'12F1' to distinguish the CICS-generated null data from user-application null data. Deferred data and the null GDS IDs CICS issues require applications to issue an extra receive for the null data. For CPI-C compatibility, and to conform with the APPC architecture, CICS no longer uses the deferred data technique, and hence removes the need to send null GDS IDs.

The removal of deferred data can mean that your existing APPC mapped conversations require one less EXEC CICS RECEIVE. However, if they are written according to the guidelines in the *CICS Distributed Transaction Programming Guide*, which recommends that applications use the EIB flags instead of using a predetermined number of RECEIVEs, they should continue to work unchanged. This is also true for applications running on earlier releases of CICS that communicate with an application running on CICS TS Release 1.

Negative response to SYNCPOINT

If an application in an earlier release of CICS receives a negative response to a syncpoint request, the CICS syncpoint manager abends the transaction. The APPC architecture requires that receipt of a negative response results in backout processing.

Now, CICS does **not** abend your application programs if they receive a negative response from a partner program. Instead they receive EIBRLDBK, indicating that they are rolled back; that is, updates to recoverable resources are backed out, and the applications continue executing. This is illustrated in Figure 6. Although your application program may not expect its partner to issue a syncpoint rollback, it should be written to handle such an eventuality, as recommended in the *CICS Distributed Transaction Programming Guide*. If it is not written to use the EIB flags, you should modify it accordingly before migrating to CICS TS Release 1.

```
Application          CICS syncpoint manager    Partner

Issues SYNCPOINT|─────────────────────────▶|
                                            |Issues RECEIVE (EIBSYNC)
                |◀─────────────────────     |Sends  ISSUE ERROR
                 Rolls back  ◀───────────── |Issues SEND INVITE WAIT
                 Sends rollback ───────────▶|
                                            |Issues RECEIVE (EIBSYNRB)
EIBRLDBK set    |◀───────────────────────── |Issues SYNCPOINT ROLLBACK
and application
continues exec-
uting, whereas
previously it
would abend.
```
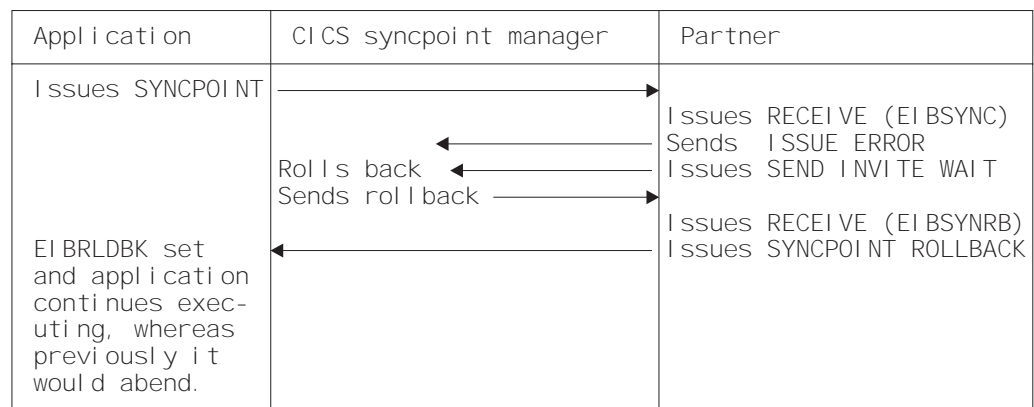
Figure 6. Processing negative response to syncpoint request in CICS TS Release 1

Two adjacent syncpoints

For mapped conversations in earlier releases of CICS, two syncpoints issued to a partner without any intervening sending and receiving of data result in the second syncpoint being ignored. This means that the partner issuing the second syncpoint increments the unit-of-work (UOW) ID, but the other partner does not. As a result, in the event of a session failure, a later resynchronization does not work because the UOW IDs are out-of-step. This is contrary to APPC unmapped or MRO conversations, where two adjacent syncpoints are supported by two syncpoint flows.

The changes mean that all syncpoint requests result in syncpoint flows to the partner, keeping the UOW IDs in step. (This makes them consistent with APPC unmapped and MRO conversations.) Thus applications using APPC mapped conversations, and which receive syncpoint commands from their partners, can receive syncpoint requests more often. However, if your applications are written according to the guidelines in the *CICS Distributed Transaction Programming Guide*, they should work unchanged.

Conversation state after rollback

There are changes to the rules governing the states of conversations after task backout. CICS uses new rules for state after rollback, while previous CICS releases use old rules for state after rollback. This change affects both MRO and APPC synclevel 2 conversations, and the changes mean that you may need to alter existing applications to use the new rules. To assist applications, CICS provides new facilities (see "New conversation state commands" on page 45) that you can use to determine the state of conversations.

Even if your applications are coded according to the guidelines in the *CICS Intercommunication Guide* for earlier versions, you may still need to change them when migrating, and the rules they should follow are described in the *CICS Distributed Transaction Programming Guide*.

To enable migrated application programs to communicate with application programs running on earlier releases, CICS supports a migration path to ensure that it uses old conventions with earlier versions. These relationships are illustrated in the following examples:

```
┌────────┐                          ┌────────┐
│CICS/VSE│        Old rules         │CICS/VSE│        (applications work
│        │◄────────────────────────►│        │         unchanged)
│  2.3   │                          │  2.3   │
└────────┘                          └────────┘

┌────────┐                          ┌────────┐
│CICS/VSE│        Old rules         │CICS TS │        (applications work
│        │◄────────────────────────►│Release │         unchanged)
│  2.3   │                          │   1    │
└────────┘                          └────────┘

┌────────┐                          ┌────────┐
│CICS TS │        New rules         │CICS TS │        (applications must
│Release │◄────────────────────────►│Release │         conform to new
│   1    │                          │   1    │         rules)
└────────┘                          └────────┘
```
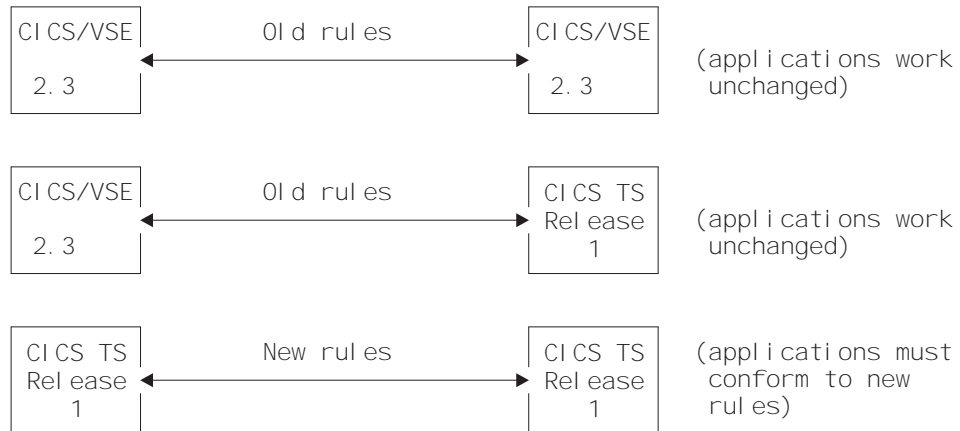
For APPC, CICS uses the Exchange Log Names flow to determine which set of rules an application should obey. (See the *LU6.2 Reference: Peer Protocols* manual, SC31-6808-1 for information about the Exchange Log Names function.) Using this function ensures that CICS remembers, over warm and emergency restarts, which set of rules it was using with a particular LU. When you convert an LU from an earlier release of CICS, ensure that CICS changes from the old to the new rules. To make this upgrade to the new rules, ensure that both sides of a conversation send a "cold" Exchange Log Names flow, which you can achieve in one of two ways:

- Perform a cold start of both CICS regions.

- Issue a CEMT SET CONNECTION(*sysid*) NOTPENDING on each side of the connection.

You need only take this special action the first time the rules upgrade takes place, and only if the CICS TS Release 1 region has the same LU name it had when running under the earlier release. Once you have taken this action, all subsequent starts (either cold, warm, or emergency) will use the new rules.

This migration consideration is only applicable to distributed transaction processing applications that use MRO or APPC synclevel 2. Applications that use other

synclevels, or use transaction routing or function shipping, continue to work unchanged.

New conversation state commands

To help you determine the conversation state of an MRO or APPC conversation, CICS TS Release 1 provides two versions of a new API command. These are:

```
EXEC CICS EXTRACT ATTRIBUTES
          [CONVID(name)]
          STATE(cvda)

EXEC CICS GDS EXTRACT ATTRIBUTES
          [CONVID(name)]
          STATE(cvda)
```

You can issue an EXEC CICS EXTRACT ATTRIBUTES STATE command at any point during the conversation, but it is particularly useful after a rollback.

The API is also enhanced by the addition of a new STATE option on most of the MRO and APPC conversation commands. This provides your application with the state of the conversation after each command. You do not have to use the STATE option to determine your conversation state, but you are recommended to do so because it provides better information than can be deduced from EIB settings.

See the *CICS Application Programming Reference* manual for details of the EXEC CICS EXTRACT ATTRIBUTES STATE command, and the new STATE option and associated values that CICS returns. See the *CICS Distributed Transaction Programming Guide* for information on the usage of the STATE option for both MRO and APPC conversations.

Return data and status on RECEIVE

CICS returns as much data and conversation status as possible on each RECEIVE command, regardless of the synclevel. This is particularly important for CPI-C portability.

With all synclevels working the same way, there may be circumstances when the number of RECEIVE commands required is different from previous releases of CICS. Applications using synclevel 1 may need **one less** RECEIVE command than previously, and applications using synclevel 2 may need **one more**. However, applications that are written according to the recommendations in the *CICS Distributed Transaction Programming Guide* (that is, they are controlled by the EIB flags rather than a predetermined number of receives) should continue to work unchanged.

PROCNAME extended to 64 characters

To conform to the APPC architecture, the PROCNAME operand of the CONNECT PROCESS and GDS CONNECT PROCESS commands is increased from 32 characters to 64 characters. Therefore, if you assemble or compile an existing APPC program you will receive a warning message from the translator.

To complement this change, EXTRACT PROCESS and GDS EXTRACT PROCESS commands are changed by the addition of the MAXPROCLEN field. MAXPROCLEN specifies the buffer length of PROCNAME. If you do not specify MAXPROCLEN, then the buffer defaults to 32 bytes, in which case you should

define PROCNAME also as 32 characters, and EXTRACT PROCESS and GDS EXTRACT PROCESS commands work unchanged. If you specify MAXPROCLEN as greater than 32 characters, up to the maximum of 64 characters, you should define PROCNAME with the same number of characters as MAXPROCLEN. CICS returns a LENGERR condition if the actual length of PROCNAME is greater than MAXPROCLEN.

See the *CICS Application Programming Reference* manual for more information about these operands.

Backout Required condition change

The implementation of CICS support for CPI-C in CICS TS Release 1 may require you to change applications that do not follow recommended coding standards about explicit syncpointing. A Backout Required condition is set on a protected conversation when:

* An application receives a Backout, Deallocate Abend, or Session Outage Notification

* An application sends a Deallocate Abend

Note: A protected conversation is a CICS APPC or MRO conversation allocated with synclevel 2, or a CPI-C conversation allocated with the synclevel set to CM_SYNC_POINT.

If the Backout Required condition is set and the application issues an EXEC CICS SYNCPOINT command (or an SAA resource recovery SRRCMIT call) CICS performs a rollback and returns the ROLLEDBACK (RR_BACKED_OUT for the SAA resource recovery interface) condition. This is a change from earlier releases, where the syncpoint request completes successfully and CICS returns a normal condition.

If an application does ***not*** issue an explicit syncpoint request, and issues an EXEC CICS RETURN when the Backout Required condition is set, CICS abends the task with an ASPN abend. This abend ensures that the rollback does not occur without your application knowing about it, which would be the case if CICS performed the rollback on the implicit end-of-task syncpoint that normally occurs on an EXEC CICS RETURN command.

Migration planning summary

In summary, you can connect CICS regions to other CICS regions using ISC or MRO. The function available is at the level of the lower release involved in the connection.

The key points to remember are:

* You can have only one APPC connection between two CICS regions, and you cannot have both an APPC and an LUTYPE6.1 connection between two CICS systems.

* If you have any distributed transaction processing (DTP) applications that use CICS APPC commands, changes to the CICS implementation of the APPC architecture could mean you need to change the APPC applications before you can migrate them.

- Applications issuing consecutive send requests can now receive responses (negative or signal) earlier than on CICS for VSE/ESA Version 2.3 systems.

- For CPI-C compatibility, and to conform with the APPC architecture, CICS does not use the deferred data technique, and hence removes the need to send null GDS IDs.

- CICS does not abend your application programs if they receive a negative response from a partner program. Instead they receive EIBRLDBK, indicating that they are rolled back; that is, updates to recoverable resources are backed out, and the applications continue executing.

- All syncpoint requests result in syncpoint flows to the partner, keeping UOW IDs in step.

- CICS uses new rules for state after rollback, while previous CICS/VSE releases use old rules for state after rollback. This change affects both MRO and APPC synclevel 2 conversations, and the changes mean that you may need to alter existing applications to use the new rules.

- CICS returns as much data and conversation status as possible on each RECEIVE command, regardless of the synclevel. This is particularly important for CPI-C portability.

- To conform to the APPC architecture, the PROCNAME operand of the CONNECT PROCESS and GDS CONNECT PROCESS commands is increased from 32 characters to 64 characters. Therefore, if you assemble or compile an existing APPC program you will receive a warning message from the translator.

  To complement this change, EXTRACT PROCESS and GDS EXTRACT PROCESS commands are changed by the addition of the MAXPROCLEN field.

- The implementation of CICS support for CPI-C may require you to change application programs that do not follow recommended coding standards about explicit syncpointing.

Part 3. CICS structure and initialization

Table 14. Structure and set up road map	
If you want to...	**Refer to...**
Know more about the CICS restructure and domain architecture	Chapter 10, "CICS structure and storage requirements" on page 51
Evaluate system storage requirements	"Specifying storage requirements" on page 57
Know about the changes made to system and task purging mechanisms	"Purging tasks" on page 61
Know more about the changes to system initialization	Chapter 11, "Initialization" on page 65
Know more about the requirements for various CICS data sets	Chapter 12, "CICS system data sets" on page 79

Chapter 10. CICS structure and storage requirements

Although CICS continues to maintain upward compatibility at the level of the CICS application programming interface (API), there are major changes to the structure and operating characteristics of CICS.

The new CICS structure

Selected parts of CICS are restructured into a number of **domains**. The domain structure:

- Improves the quality of CICS code

- Improves serviceability

- Provides full 31-bit support

- Allows distribution as object code only (OCO)

- Positions CICS to take advantage of changes in hardware and software architectures

- Enhances CICS use of the extended architecture provided by VSE/ESA

Each domain encapsulates all its functions (such as domain initialization and termination) and associated state data, which is accessible only from within the domain.

A domain communicates with the rest of CICS using strictly-defined interfaces. Other parts of CICS cannot access domain state data other than through a domain call. Domains call one another by specifying the required domain gate[2] where they would otherwise specify the entry point of the target program.

The new architecture is shown in Figure 7, and is followed by a brief description of each domain.

---

[2] A domain gate is an entry point into a domain. The domain and gate together identify the program to be invoked.

```
┌─────────────────────┐              ┌─────────────────────┐
│ Application         │              │ Monitoring domain   │
│   domain      (AP)  │──┐        ┌──│              (MN)   │
└─────────────────────┘  │        │  └─────────────────────┘
┌─────────────────────┐  │        │  ┌─────────────────────┐
│ CICS catalog        │──┤        ├──│ Parameter manager   │
│   domains (GC/LC)   │  │        │  │   domain      (PA)  │
└─────────────────────┘  │  ┌──┐  │  └─────────────────────┘
┌─────────────────────┐  │  │  │  │  ┌─────────────────────┐
│ Directory manager   │──┤  │  │  ├──│ Program manager     │
│   domain      (DD)  │  │  │Ke│  │  │   domain      (PG)  │
└─────────────────────┘  │  │rn│  │  └─────────────────────┘
┌─────────────────────┐  │  │el│  │  ┌─────────────────────┐
│ Dispatcher domain   │──┤  │  │  ├──│ Security manager    │
│              (DS)   │  │  │li│  │  │   domain      (XS)  │
└─────────────────────┘  │  │nk│  │  └─────────────────────┘
┌─────────────────────┐  │  │ag│  │  ┌─────────────────────┐
│ Domain manager      │──┤  │e │  ├──│ Statistics domain   │
│   domain      (DM)  │  │  │  │  │  │              (ST)   │
└─────────────────────┘  │  │ro│  │  └─────────────────────┘
┌─────────────────────┐  │  │ut│  │  ┌─────────────────────┐
│ Dump domain         │──┤  │in│  ├──│ Storage manager     │
│              (DU)   │  │  │es│  │  │   domain      (SM)  │
└─────────────────────┘  │  │  │  │  └─────────────────────┘
┌─────────────────────┐  │  │  │  │  ┌─────────────────────┐
│ Kernel  domain      │──┤  │  │  ├──│ Timer domain        │
│              (KE)   │  │  │  │  │  │              (TI)   │
└─────────────────────┘  │  │  │  │  └─────────────────────┘
┌─────────────────────┐  │  │  │  │  ┌─────────────────────┐
│ Loader domain       │──┤  │  │  ├──│ Trace domain        │
│              (LD)   │  │  │  │  │  │              (TR)   │
└─────────────────────┘  │  │  │  │  └─────────────────────┘
┌─────────────────────┐  │  │  │  │  ┌─────────────────────┐
│ Lock manager        │──┤  │  │  ├──│ Transaction mgr     │
│   domain      (LM)  │  │  │  │  │  │   domain      (XM)  │
└─────────────────────┘  │  │  │  │  └─────────────────────┘
┌─────────────────────┐  │  │  │  │  ┌─────────────────────┐
│ Message domain      │──┘  └──┘  └──│ User domain         │
│              (ME)   │              │              (US)   │
└─────────────────────┘              └─────────────────────┘
```

Figure 7. CICS organization—domains.   The domain identifiers are shown in parentheses

- **Application (AP) domain**
  Application programs run in the application domain. The CICS management
  programs within the AP domain are not restructured, but nevertheless
  communication between the AP domain and the other domains is also through
  the new domain interface. Although the AP domain represents unrestructured
  CICS, there are still many changes, for example, changes to control blocks.

  Figure 8 on page 53 shows the major components of the AP domain.

```
                              ┌─────────────────────┐
                              │      AP domain      │
                              └──────────┬──────────┘
     ┌──────────────────┐                │
     │ Application      ├────────────────┤
     │ services         │                │
     └──────────────────┘                │
        ─── Basic mapping support        │
        ─── Built-in functions     ┌──────────────────┐
        ─── Command interpreter     │ System reliability │
        ─── Data interchange program└──────────────────┘
        ─── Execution diagnostic        ─── Abnormal condition
               facility                        program
                                         ─── Dynamic backout
                                         ─── Emergency restart
     ┌──────────────────┐               ─── Keypoint programs
     │ Extended recovery├────────────────── Node abnormal
     │ facility         │                      condition program
     └──────────────────┘               ─── Node error program
                                         ─── Program error program
                                         ─── Retry program
     ┌──────────────────┐               ─── System recovery program
     │ Intercommunication├───────────────── Task-related user
     │ facilities       │                      exit recovery
     └──────────────────┘               ─── Terminal abnormal
                                               condition program
        ─── Distributed transaction     ─── Terminal error program
               processing
        ─── Function shipping
        ─── Interregion communication
        ─── Transaction routing
        ─── VTAM LU6.1
        ─── VTAM LU6.2

     ┌──────────────────┐
     │ System control   ├───────────────┐
     └──────────────────┘               │
        ─── AP domain initialization  ┌──────────────────┐
        ─── AP domain termination     │ System services  │
        ─── Language Environment interface └──────────────┘
        ─── EXEC interface program      ─── Dynamic allocation
        ─── File control                ─── Field engineering
        ─── Interval control                   program
        ─── Journal control             ─── "Good morning" message
        ─── Resource recovery manager          program
        ─── Storage compatibility       ─── Master terminal program
        ─── Syncpoint program           ─── Message switching
        ─── Table manager               ─── Operator terminal
        ─── Task-related user exit control ─── Resource definition
        ─── Temporary-storage control   ─── Signon and sign-off
        ─── Terminal control            ─── System spooling interface
        ─── Trace compatibility         ─── Time-of-day control
        ─── Transient data control
        ─── User exit control
```
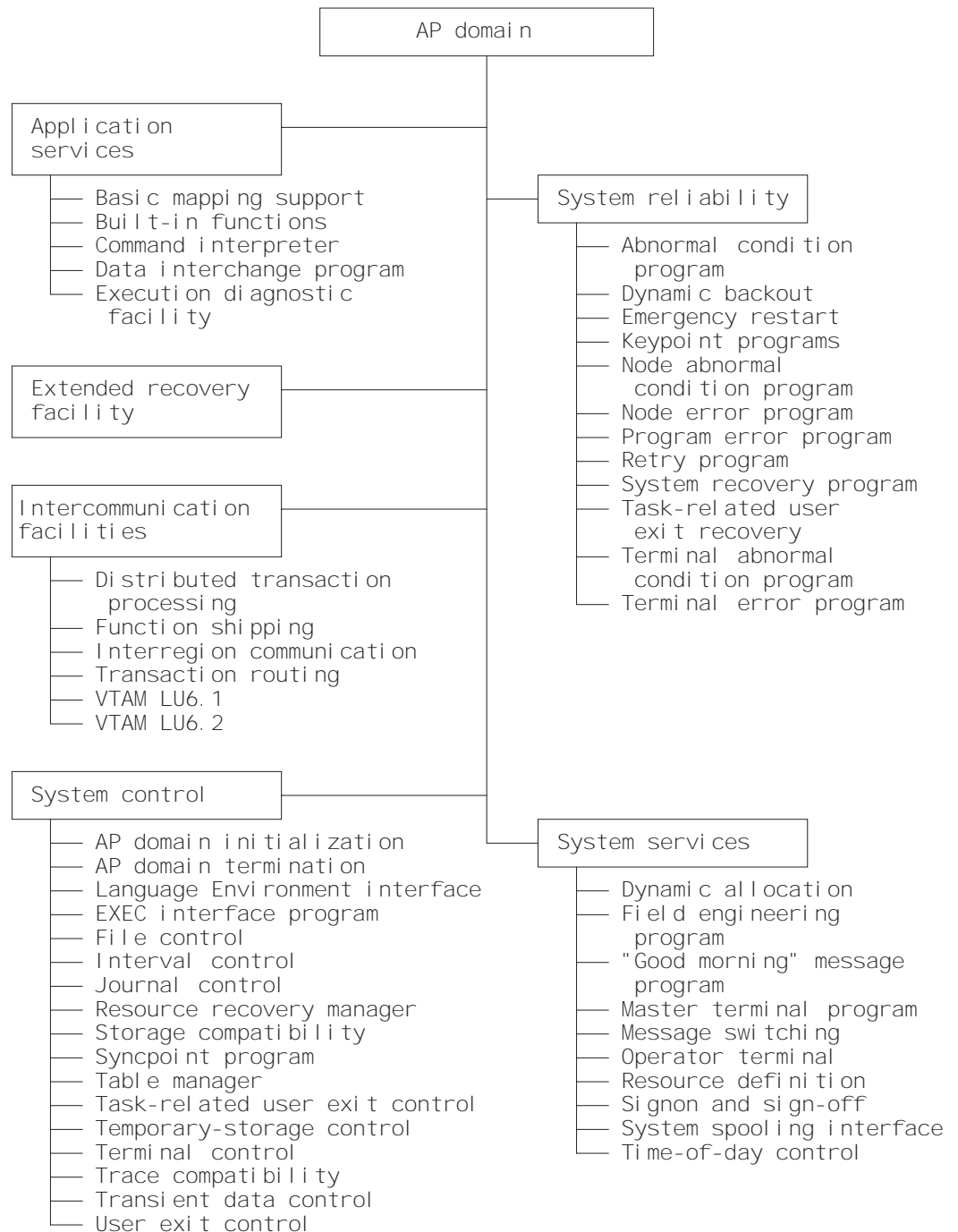
Figure 8. AP domain—major components

- **CICS catalog domains**

  There are two catalog domains: the local catalog domain and the global catalog domain. They are used by the other domains to hold information relating to an orderly restart. They allow CICS read, write, and purge records on the local and global catalog data sets so that a record of the status of CICS can be maintained when CICS is not running. The catalog domains use a common set of programs to provide a domain interface to VSAM KSDS data sets and they conceal the underlying VSAM operations from the calling domain.

  The local catalog holds information relevant to a particular CICS system, including a list of domains.

The global catalog holds information applicable to the whole CICS system. Therefore, in an XRF system consisting of one active and one alternate CICS system, there are two local catalogs and one global catalog. Conversely, in a non-XRF system, there is one local catalog and one global catalog.

- **Directory manager (DD) domain**
  The directory manager domain is a service component, providing resource table lookup services for the other domains (except the application (AP) domain, which uses the table manager program). The resources include:

  – Transaction definitions
  – Remote transaction definitions
  – Transaction classes
  – TP names
  – User attributes
  – Programs
  – BMS map sets and partition sets

  The table manager program handles:

  – Terminals
  – Connections
  – Sessions
  – Modegroups
  – Files
  – Profiles
  – Autoinstall terminal models

- **Dispatcher (DS) domain**
  The dispatcher domain controls the attaching, running, and detaching of tasks, and controls the scheduling of VSE tasks.

- **Domain manager (DM) domain**
  The domain manager domain maintains (through the use of catalog services) permanent information about the status of individual domains. The domain manager domain also attaches initialization and termination tasks for the other domains.

- **Dump (DU) domain**
  The dump domain produces storage dumps and handles the associated data sets (transaction and system dump data sets) and status in the CICS system.

- **Kernel (KE) domain**
  The kernel domain is the main CICS control structure. The kernel tracks the existence of domains and is involved in every call from one domain to another, thereby providing a consistent linkage and recovery environment for CICS. Serious system errors can result in the termination of the kernel domain with a system dump containing diagnostic and problem determination information.

- **Loader (LD) domain**
  The loader domain is used by the other domains to gain access to storage-resident copies of nucleus and application programs, maps, and tables.

- **Lock manager (LM) domain**
  The lock manager domain provides both locking and associated queueing facilities for CICS resources. Each resource is associated with a unique lock name that is used to access locking facilities.

- **Message (ME) domain**

The message domain acts as a centralized repository for storing and issuing CICS messages for all parts of restructured CICS. This ensures consistency of messages issued by the central controlling structures of CICS.

- **Monitoring (MN) domain**

  The monitoring domain controls all monitoring functions within CICS. Monitoring data is written to Data Management Facility (DMF)[3] data sets, and can be used for subsequent processing by the monitoring utility program (DFHMNDUP).

- **Parameter manager (PA) domain**

  The parameter manager controls the process of applying system initialization parameters to CICS. Initialization takes place using standardized interfaces that provide an improved method of communicating between functional areas of CICS.

- **Program manager (PG) domain**

  The program manager domain provides support for the following areas of CICS:

  – Program control functions such as EXEC CICS LINK, XCTL, LOAD, RELEASE, and RETURN

  – Transaction abend and condition handling functions, such as EXEC CICS ABEND, HANDLE ABEND, HANDLE CONDITION, and HANDLE AID

  – Related functions, such as invoking user-replaceable programs, global user exits, and task-related user exits

  – Autoinstall for programs, map sets, and partition sets.

- **Security manager (XS) domain**

  The security function (previously provided by the security identification program DFHACEE) controls:

  – Multiple sign-ons by the same user
  – Security messages
  – Warnings when a password is about to expire
  – Idle terminal signoff timeout.

  It also provides an optional facility for checking user authority to run transactions and access resources.

  The security function is split into two domains; the *user* domain and the *security* domain. The security domain manages the security capabilities of users and handles all the interfaces to the external security manager (ESM).

- **Statistics (ST) domain**

  The statistics domain controls the collection of resource statistics for a CICS system. The statistics domain collects statistics data at a user-specified interval, at a system quiesce or at a logical end-of-day, and when requested to by the user. Statistics data is written to Data Management Facility (DMF) data sets, and can subsequently be used by the statistics offline utility (DFHSTUP) to produce formatted reports.

3

---

3 DMF is a facility that simulates the MVS/ESA System Management Facility (SMF). See the *CICS Operations and Utilities Guide* for more information about DMF.

* **Storage manager (SM) domain**

  The storage manager domain manages virtual storage requests for the CICS system.

* **Timer (TI) domain**

  The timer domain provides interval timing and alarm clock services for the other domains. The TI domain also provides date and time facilities and conversion functions, including the ability to synchronize the CICS local time with the operating system clock when the system operator has adjusted the time zone.

* **Trace (TR) domain**

  The trace domain is used by CICS system code and user application programs to record details of the sequence of events occurring in the CICS system. The basic unit of information created for this purpose is the trace entry. The trace domain can write trace entries to:

  - Internal trace, which is a wraparound table in main storage in the CICS address space

  - Auxiliary trace, which is a pair of CICS-controlled SAM data sets used alternately

* **Transaction manager (XM) domain**

  The transaction manager domain provides transaction-related services to:

  - Create tables
  - Terminate, purge and inquire on tasks
  - Manage transaction definitions and classes

  The transaction manager domain also provides a transaction environment that allows other CICS components to implement transaction-related services.

* **User (US) domain**

  The user domain restructures the function previously provided by the CICS sign-on facility.

Storage

Virtual storage constraint relief (VSCR)

4   The process of moving as much CICS code and as many control blocks as
4   possible above 16MB continues, leaving more storage available below 16MB for
4   user applications. Only CICS code and data areas that have a dependency on
4   24-bit addressing are left below 16MB, providing considerable virtual storage
4   constraint relief (VSCR).

4   A consequence of this change is the provision of a number of new system
4   initialization parameters, plus some new resource definition attributes that allow you
4   to specify whether CICS should acquire task-related storage above or below 16MB.
4   An example is the new TASKDATALOC keyword on RDO TRANSACTION
4   definitions. However, all of these new options default to below 16MB, ensuring
4   existing application programs can run unchanged.

4   For more detailed information, see the *CICS Resource Definition Guide*.

4 **Specifying storage requirements**

4 There are eight dynamic storage areas (DSAs)—four above and four below 16MB.
4 CICS allocates storage for them according to the values you specify on the new
4 DSALIM and EDSALIM system initialization parameters. These values represent
4 the *upper limit* of the total storage that CICS can allocate to the DSAs.

4 CICS creates the following DSAs below 16MB:

4 **The user DSA (UDSA)**
4 The user-key storage area for all user-key task-lifetime storage below 16MB.

4 **The read-only DSA (RDSA)**
4 The key-0 storage area for all reentrant programs and tables below 16MB.

4 **The shared DSA (SDSA)**
4 The user-key storage area for any non-reentrant user-key RMODE(24)
4 programs, and also for any storage obtained by programs issuing EXEC CICS
4 GETMAIN commands for storage below 16MB with the SHARED option.

4 **The CICS DSA (CDSA)**
4 The CICS-key storage area for all non-reentrant CICS-key RMODE(24)
4 programs, all CICS-key task-lifetime storage below 16MB, and for all CICS
4 control blocks that reside below 16MB.

4 Optionally, to fix the sizes of these four DSAs, use the UDSASZE, RDSASZE,
4 SDSASZE and CDSASZE system initialization parameters respectively. The
4 default size for each of these DSA parameters is 0, indicating that the DSA size
4 can be changed by CICS dynamically.

4 CICS creates the following extended DSAs (EDSAs) above the 16MB line:

4 **The extended user DSA (EUDSA)**
4 The user-key storage area for all user-key task-lifetime storage above 16MB.

4 **The extended read-only DSA (ERDSA)**
4 The key-0 storage area for all reentrant programs and tables above 16MB.

4 **The extended shared DSA (ESDSA)**
4 The user-key storage area for any non-reentrant user-key RMODE(ANY)
4 programs, and also for any storage obtained by programs issuing EXEC CICS
4 GETMAIN commands for storage above 16MB with the SHARED option.

4 **The extended CICS DSA (ECDSA)**
4 The CICS-key storage area for all non-reentrant CICS-key RMODE(ANY)
4 programs, all CICS-key task-lifetime storage above 16MB, and for all CICS
4 control blocks that reside above 16MB.

4 Optionally, to fix the sizes of these four extended DSAs use the EUDSASZE,
4 ERDSASZE, ESDSASZE, and ECDSASZE system initialization parameters
4 respectively. The default size for each of these DSA parameters is 0, indicating
4 that the DSA size can be changed by CICS dynamically.

4 Figure 9 shows the conceptual view of the key storage elements in the CICS
4 address space. You can vary these overall limits dynamically by using either the
4 CEMT SET SYSTEM command or an EXEC CICS SET SYSTEM command, with
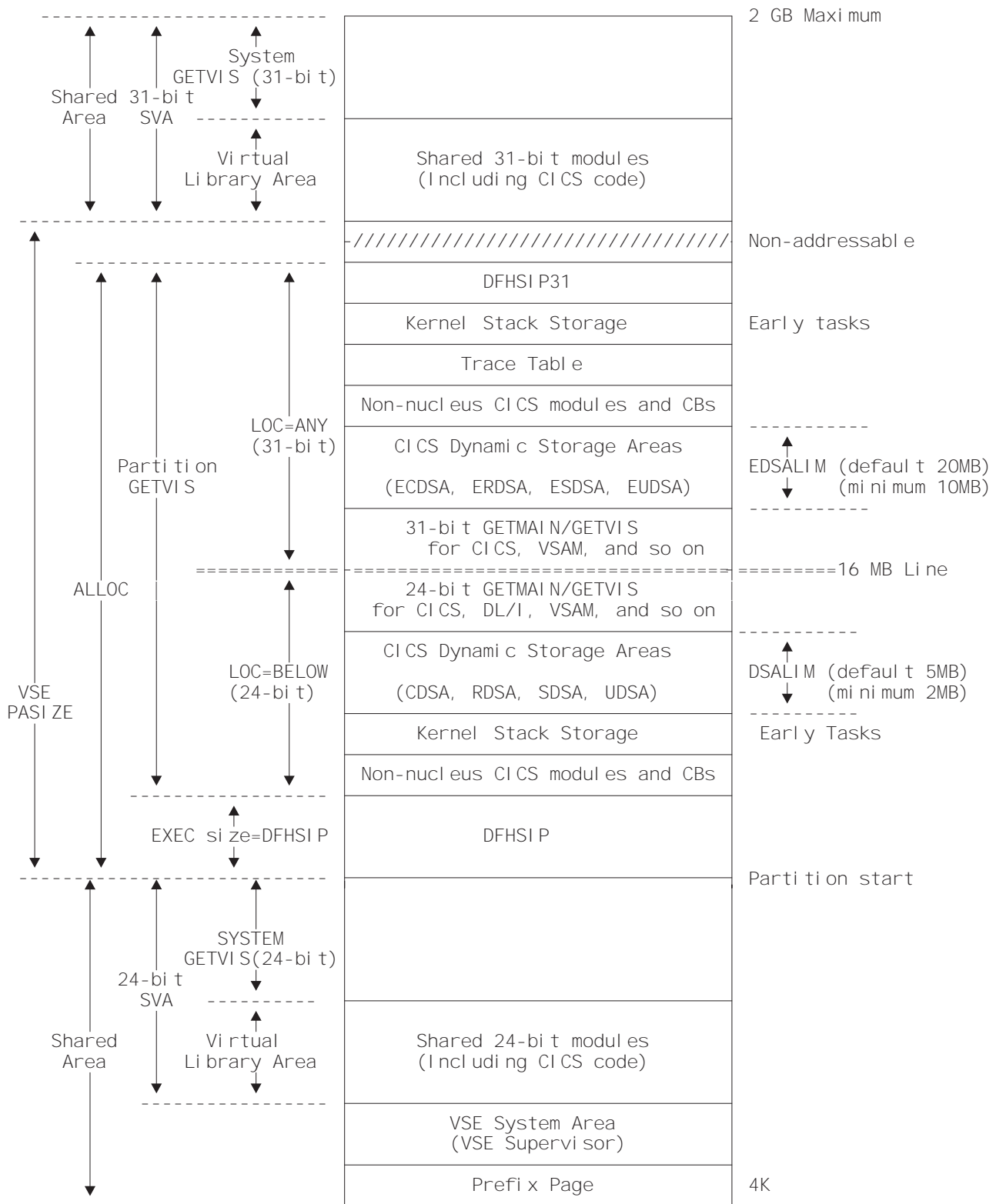4 the options DSALIMIT and EDSALIMIT.

```
                                                              2 GB Maximum
-----------------------------
    ↑         ↑         ↑     |
            System     |      |
         GETVIS (31-bit)|     |
  Shared 31-bit SVA ----------|
   Area    |               |  |     Shared 31-bit modules
         Virtual          |   |     (Including CICS code)
       Library Area       |   |
    ↓         ↓         ↓     |
-----------------------------
 ↑                           |-//////////////////////////////  Non-addressable
-----------------------------
 |  ↑         ↑         ↑     |     DFHSIP31
 |                           |
 |                           |     Kernel Stack Storage        Early tasks
 |                           |
 |                           |     Trace Table
 |                           |
 |        LOC=ANY           |    Non-nucleus CICS modules and CBs
 |        (31-bit)          |                                    -----------
 |                           |     CICS Dynamic Storage Areas        ↑
 | Partition                |                                   EDSALIM (default 20MB)
 | GETVIS                   |     (ECDSA, ERDSA, ESDSA, EUDSA)       ↓   (minimum 10MB)
 |                           |                                    -----------
 |                           |     31-bit GETMAIN/GETVIS
 |                           |        for CICS, VSAM, and so on
 |           ↓         ↓     |==================================== ===========16 MB Line
 | ALLOC        ↑           |     24-bit GETMAIN/GETVIS
 |                           |     for CICS, DL/I, VSAM, and so on
 |                           |                                    -----------
 |                           |     CICS Dynamic Storage Areas
 |        LOC=BELOW         |                                   DSALIM (default 5MB)
 |        (24-bit)          |     (CDSA, RDSA, SDSA, UDSA)            ↓   (minimum 2MB)
 | VSE                      |                                    -----------
 | PASIZE                   |     Kernel Stack Storage          Early Tasks
 |                           |
 |  ↓         ↓         ↓     |    Non-nucleus CICS modules and CBs
 |   -----------------------
 |    ↑                      |     DFHSIP
 |  EXEC size=DFHSIP        |
 ↓                           |
-----------------------------                                   Partition start
    ↑         ↑         ↑     |
            SYSTEM          |
          GETVIS(24-bit)    |
   24-bit                  |
    SVA     -----------    |
    |        Virtual        |     Shared 24-bit modules
  Shared    Library Area    |     (Including CICS code)
   Area     |               |
    |     ----------------- |     VSE System Area
    |                       |     (VSE Supervisor)
    ↓         ↓         ↓    |     Prefix Page                   4K
-----------------------------
```

Figure 9. Key storage elements in the CICS address space

For more information about calculating storage sizes for the DSAs and other storage components, see the *CICS Performance Guide*.

For more information about the various system initialization parameters, see the *CICS System Definition Guide*.

Storage requirements for MXT

In earlier versions of CICS, you can use the MXT system initialization parameter to specify the maximum number of tasks that CICS can allow at any one time. The definition of the MXT system initialization parameter is changed to specify the number of **user** tasks allowed to exist at any one time. In addition to the number you specify for user tasks, up to 15 **system** tasks can exist at any one time. Storage for 5 of these system tasks is allocated early in CICS initialization from partition GETVIS (these tasks are referred to as **early** CICS system tasks), and storage for the remainder is allocated from DSA or EDSA storage. Therefore, allow for up to 10 system tasks when calculating the dynamic storage limits, DSALIM and EDSALIM.

System task kernel storage requirements

Early in CICS initialization, kernel stack storage is acquired for five system tasks from non-DSA storage, both above and below 16MB. This storage is pre-allocated and is not freed.

Subsequently, storage is allocated for system tasks from the CICS DSAs, above and below 16MB. This allocation of storage for system tasks is generally allocated dynamically when required and is freed when the task is terminated. However, although the storage is managed dynamically, there can be up to 15 of these CICS tasks running at any one time. Therefore, you should allow for this number of tasks when calculating dynamic storage limits.

User task kernel storage requirements

Unlike storage for system tasks, kernel stack storage for user tasks is not acquired dynamically. Instead it is pre-allocated from the DSAs. The number of kernel stack storage segments allocated corresponds to the maximum number of tasks you specify on the MXT system initialization parameter.

In addition, to reduce the possibility of an overflow and to improve performance, an extra stack segment, one above and one below 16MB, is allocated for every 10 user tasks (MXT=10), rounded down.

This storage is freed only if the MXT limit is reduced (by the use of a CEMT or EXEC CICS SET SYSTEM MAXTASKS command).

The size of kernel stack segments

The size of the kernel stack storage segments is the same for both CICS system tasks and user tasks. The storage for each task above 16MB is 12KB and the storage for each task below 16MB is 2KB.

If a task overflows beyond the storage allocated, CICS obtains a further 4KB extension from either DSA or EDSA storage.

For more information about storage-related system intialization parameters, see the *CICS System Definition Guide*.

Example

If you specify MXT=100, CICS requires 260KB of DSA storage and 1360KB of EDSA storage. The formula for calculating DSA or EDSA storage is storage for dynamic system tasks plus storage for user tasks plus storage for overflow segments.

For example, for DSA storage, this would be:

```
(10 * 2K) + (100 * 2K) + (100/10 * 4K) = 260K
```

For EDSA storage, this would be:

```
(10 * 12K) + (100 * 12K) + (100/10 * 4K) = 1360K
```

In addition, CICS requires 10KB of non-DSA storage below 16MB and 60KB of non-DSA storage above 16MB for the "early" CICS system tasks.

Defining applications that run in the EDSA

In earlier releases of CICS, application programs link-edited with the RMODE(ANY) attribute are VSE-loaded above 16MB. These RMODE(ANY) programs are not subject to the normal CICS program compression, even if they are defined as RESIDENT(NO), and therefore, once loaded, are never deleted. (CICS takes this default action with the view that because these programs are above 16MB, there is sufficient storage to keep them resident and therefore there is nothing to be gained by deleting them.)

This behavior is changed, and CICS does not ignore the RESIDENT(NO) attribute. Therefore, if you have application programs that rely upon particular programs remaining resident, change the program resource definition to specify RESIDENT(YES). For example, you might have an application program that needs to reference data held in a load table. For this purpose an application program may load the table by issuing a LOAD command and save the address of the table for use by other programs. Now, an application program attempting to reference such data could fail to locate the table at the saved address unless you ensure that CICS keeps the table resident. Either define such load modules as RESIDENT(YES), or load them with the HOLD option on the EXEC CICS LOAD command.

Changes to temporary storage data structures

The internal data structures of CICS temporary storage are changed. If you have applications that are dependent on the format and structure of temporary storage data (and it is best not to), you must modify your programs to work with the new structures. For more information about the new structures, see the *CICS Data Areas* manual.

31-bit interregion communication program, DFHIRP

If a migrated CICS region is coexisting with CICS for VSE/ESA Version 2.3 using multiregion operation (MRO), ensure that the latest version of DFHIRP is installed in the SVA. This is usually guaranteed if the VSE/ESA Interactive Interface (II) is used to install your system.

DFHIRP is link-edited with the attributes AMODE(31) and RMODE(24). Storage for its control blocks is acquired above 16MB. Before you can analyze DFHIRP control blocks in a dump taken by CICS for VSE/ESA Version 2.3, apply the prerequisite PTFs for APAR PQ26631 to CICS for VSE/ESA Version 2.3.

Applying the PTFs enables the CICS formatted-dump interpreter module, DFHFDP, to process the DFHIRP control blocks correctly.

Purging tasks

CICS provides several mechanisms for purging tasks that are not currently executing as well as mechanisms to prevent individual tasks from being purged. The way in which these mechanisms interact is changed.

System purging of tasks

The stall purge facility is removed. Instead, CICS attempts to avoid stalling by modifying its algorithms before resources become unavailable. If a stall still occurs, CICS relies on the deadlock timeout mechanism to purge individual tasks and to free resources. In order for the new deadlock timeout mechanism to work, at least one transaction must be defined with a nonzero deadlock timeout interval. You must also define the transaction with the SPURGE=YES attribute for the timeout mechanism to take effect.

Changes to the SPURGE attribute on the RDO TRANSACTION definition

The meaning of the SPURGE attribute on RDO TRANSACTION resource definitions is changed from "stall-purgeable" to "system-purgeable". The deadlock mechanism is now applied (if relevant) to "waits" as well as "suspends."

As a result of this change to the task purging mechanism, the ICVS system initialization parameter is no longer needed.

Removal of the EXEC CICS INQUIRE and SET SYSTEM STALL commands

The CICS translator diagnoses occurrences of EXEC CICS INQUIRE or SET SYSTEM STALL commands as obsolete. If instances of these commands are found at runtime, CICS returns a null value for the INQUIRE command and takes no action for a SET command.

CICS treats STALL on DFHEMTA or DFHEMTP INQUIRE and SET SYSTEM STALL commands as an unrecognized keyword.

Task purge

The CICS dispatcher initiates task purging, as a result of receiving task purge requests in the following situations:

- A read timeout occurs. See the description of the RTIMOUT attribute on the RDO PROFILE resource definition in the *CICS Resource Definition Guide*.

- A deadlock timeout occurs. Many CICS-supplied transactions are defined with a DTIMOUT value. See the description of the DTIMOUT attribute on the RDO TRANSACTION resource definition in the *CICS Resource Definition Guide*.

- You purge a task by specifying the PURGE or FORCEPURGE option on a CEMT or EXEC CICS SET TASK command; for example, CEMT SET TASK(*taskid*) FORCEPURGE (see the FORCE warning below).

- You purge any task associated with a terminal by specifying the PURGE or FORCEPURGE option on a CEMT or EXEC CICS SET TERMINAL command; for example, CEMT SET TERMINAL(*termid*) PURGE (see the FORCE warning below).

- You close a file that is currently in use by a task by specifying the FORCECLOSE option on a CEMT SET FILE command; for example, CEMT SET FILE(*filename*) FORCECLOSE (see the FORCE warning below).

- You close (or disabling) a file that is currently in use by a task by specifying the FORCE option on an EXEC CICS SET FILE command; for example, EXEC CICS SET FILE(*filename*) DISABLED FORCE (see the FORCE warning below).

FORCE warning

Using the FORCEPURGE, FORCECLOSE, or FORCE options puts CICS integrity at risk. CICS is not guaranteed to execute correctly after you have used one of these options.

Types of purge

Purges can be grouped into two types:

1. Purges that the dispatcher always performs. These are purge requests resulting from:

   - A read timeout
   - A CEMT or EXEC CICS SET TASK FORCEPURGE command
   - A CEMT or EXEC CICS SET TERMINAL FORCEPURGE command
   - A CEMT SET FILE FORCECLOSE command
   - An EXEC CICS SET FILE CLOSED (or DISABLED) FORCE command

2. Purges that the dispatcher rejects or performs depending on the situation. These are purge requests resulting from:

   - A deadlock timeout
   - A CEMT or EXEC CICS SET TASK PURGE
   - A CEMT or EXEC CICS SET TERMINAL PURGE command

   The dispatcher rejects requests if the task is currently not system-purgeable or if the CICS component being used by the task cannot cope with a purge at that point.

The SPURGE parameter

Use the SPURGE attribute of the RDO TRANSACTION resource definition to specify whether or not tasks are to be initially system-purgeable (see the description of the SPURGE attribute on the RDO TRANSACTION resource definition in the *CICS Resource Definition Guide*.) After a transaction definition is installed in the running system, you can change it by using a CEMT or EXEC CICS SET TRANSACTION PURGEABLE|NOTPURGEABLE command.

If you use the SPURGE option to stall purge tasks running on existing CICS for VSE/ESA Version 2.3 regions, you should review your transaction resource

definitions that specify SPURGE(YES) to decide on an appropriate DTIMOUT value.

Migration planning summary

The key points to remember are that you need to:

- Calculate upper storage limits for the new DSALIM and EDSALIM system initialization parameters.

  Optionally, you can specify fixed sizes for the eight dynamic storage areas using the CDSASZE, RDSASZE, SDSASZE, UDSASZE, ECDSASZE, ERDSASZE, ESDSASZE, and EUDSASZE system initialization parameters. The default is for CICS to determine the sizes dynamically within the limits of EDSLIM and EDSALIM.

- Remove the ICVS system initialization parameter.

- Remove EXEC CICS INQUIRE and SET SYSTEM STALL commands from your programs.

- Recalculate and specify your MXT value.

- Check for any programs that rely on the internal structure of CICS temporary storage data.

- Check your use of CICS task purging mechanisms and adjust the new values to your requirements.

Chapter 11. Initialization

The functional changes are reflected in the options available at CICS initialization. There are changes to the way CICS manages the system initialization process as well as changes to the operational procedures involved in initializing the system. There are also substantial changes to the system initialization parameters and overrides themselves.

As with the other major control structures in CICS, the system initialization process is changed to enhance the integrity, usability, and performance of initialization.

System initialization now takes place using standardized CICS interfaces that provide an improved method of communicating between functional areas of CICS. The system initialization parameters, in the form of the system initialization table and overrides, are managed by the parameter manager domain. Initialization is controlled by the domain manager, which operates within the new domain structure, reducing the risk of system errors occurring. Any that do occur are isolated which helps to limit their effects on your CICS system. Keeping the central CICS management functions insulated from one another reduces the difficulty of tracing, isolating, and solving any problems that occur.

Read about the system administration implications of the initialization changes described in this chapter to ensure you select the new and changed options appropriate for you.

Also check the system initialization parameters that you currently use to:

*   Ensure that they are still supported
*   Remove any that are obsolete
*   Add the new parameters you need
*   Ensure that the changed defaults do not adversely affect your system.

To make it easier to get started with the new system initialization parameters, CICS provides a default (unsuffixed) system initialization table, DFHSIT. The source for this unsuffixed table is in member DFHSIT$$ of the VSE/ESA sublibrary PRD1.BASE. You can use this table, overriding default values from a SYSIPT data set, and thus avoid the need to assemble your own SIT. VSE/ESA also provides the source for the standard environment SITs in IJSYSRS.SYSLIB.

Changes to PLTPI processing

The sequence of events during initialization is changed. There are now two phases of program list table (PLT) processing during initialization. These two phases are separated by the inclusion of the following statement at the appropriate point among the DFHPLT TYPE=ENTRY macros for the programs:

```
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
```

During the first phase of PLTPI processing, you can run only those programs that enable user exits.

The way in which CICS loads the PLT is changed. This means that you do not need a program resource definition for the PLT itself. However, CICS still needs

you to define the PLT programs listed in the PLT using suitable RDO PROGRAM resource definitions.

First-phase PLTPI programs **must** be written in assembler-language and run in AMODE(31). If they are not, they fail with an AKEA abend. Convert any existing assembler AMODE(24) programs you wish to run during first-phase PLTPI to ensure they can run in AMODE(31).

See the *CICS Customization Guide* for further information about writing PLT programs.

API command restrictions in PLT programs

The CICS commands that first-phase PLTPI programs can issue are restricted to the following:

- EXEC CICS ENABLE commands (to enable user exits)
- EXEC CICS HANDLE commands (for all conditions that might be raised)
- EXEC CICS RETURN (to return control to CICS)

If you issue EXEC CICS commands other than these commands during the first phase of PLT processing the results are unpredictable and CICS may go into a wait state.

Using PLTs from CICS for VSE/ESA Version 2.3

To migrate a PLT from CICS for VSE/ESA Version 2.3, reassemble the table with a PROGRAM=DFHDELIM statement included in the correct place.

The second stage of PLTPI processing

All other PLTPI programs should be run during the second phase of PLTPI processing. This corresponds to the single-phase PLTPI processing of previous releases.

Using EXEC CICS START commands in second-phase PLT programs

The changes to the sequence of CICS initialization can affect transactions started from second-phase PLT programs. If you have any second-phase PLTPI programs that issue EXEC CICS START commands with a zero delay interval, there is a possibilty that the started transaction may run before all the necessary CICS resources are available. To avoid this happening, make sure that a started transaction issues an EXEC CICS INQUIRE SYSTEM CICSSTATUS command to determine the execution status of CICS. The started transaction should attempt to use CICS services only when the CICSSTATUS value is ACTIVE, otherwise the results could be unpredictable.

Removal of system initialization overlays

The changes to initialization processing mean that system initialization overlays cannot be used. Consequently, the SIMODS system initialization parameter is removed. If you currently perform initialization tasks using system initialization overlays, review these tasks and convert them to run during the second stage of PLTPI processing.

Automatic initialization

CICS initializes the following automatically, removing the need for system initialization parameters:

- The CPI-C environment
- The IBM Language Environment for VSE/ESA interface

Changes to the SIT and its parameters and overrides

The system initialization table (SIT) is very different from the SIT of previous versions of CICS. A complete review of existing tables and start up jobstreams is needed. All the necessary changes should be made before you attempt to migrate.

In general, the sample SITs and jobstreams provided by VSE/ESA create a default CICS system that has the same facilities as previous versions of CICS. For more information about these sample SITs and jobstreams, see the *CICS System Definition Guide* and the *VSE/ESA 2.4 Installation* book.

The remainder of this chapter summarizes the changes made to system initialization parameters. For full descriptions of these parameters, see the *CICS System Definition Guide*.

Obsolete system initialization parameters

The following system initialization parameters are obsolete:

Table 15 (Page 1 of 2). Obsolete system initialization parameters	
Parameter	**Reason for removal**
ABDUMP	Obsolete because of the restructuring of dumping facilities.
ALEXIT	Obsolete because of the restructure of PLT processing.
ALT	Obsolete because the application load table is obsolete.
AMXT	Obsolete because of the new dispatching mechanism.
AUTINST	Superseded by the AIEXIT, AILDELAY, AIQMAX, and AIRDELAY system initialization parameters.
BFP	Obsolete because the built-in-functions program is obsolete.
CMXT	Superseded by the RDO TRANCLASS resource definition.
COBOL2	Obsolete because the VS COBOL II environment is not supported
DIP	Obsolete because DFHDIP is now always loaded as part of the CICS nucleus.
DTB	Obsolete because all dynamic log records are now spilled to main storage allocations in the extended readonly DSA (ERDSA).
EXEC	Obsolete because a command-level environment is mandatory.
EXITS	Obsolete because the user-exit interface is now always initialized.
EXTSEC	Obsolete because CICS internal security support is obsolete, and the use of a security manager is compulsory.
FERS	Obsolete because the facility error recognition system is no longer supported.

Table 15 (Page 2 of 2). Obsolete system initialization parameters	
Parameter	**Reason for removal**
ICVS	Obsolete because the stall purge mechanism is superseded.
LESTG	Obsolete because of improved DSA management for storage above 16MB.
MONITOR	Replaced by the new MN, MNCONV, MNEXC, MNFREQ, MNPER, MNSYNC, and MNTIME system initialization parameters for monitoring.
NLT	Obsolete because the nucleus load table is obsolete.
OPNDLIM	Obsolete because VTAM Version 4 removes this restriction.
PCDUMP	Obsolete because of the redesigned dump handling.
PCT	Obsolete because all transaction and profile resources must be defined using RDO.
PGSIZE	Obsolete because the CICS virtual page size is fixed at 4096 bytes.
PLI	Obsolete because DOS PL/I is no longer supported.
PPT	Obsolete because all program resources must be defined using RDO.
SCS	Obsolete because storage cushion sizes are determined automatically.
SIMODS	Obsolete because system initialization overlays are no longer supported.
SVD	Superseded by the dump table.
TRACE	Replaced by the new tracing system initialization parameters, TRTABSZ, TRTRANSZ, TRTRANTY, and USERTR.
XRFTRSZ	Obsolete because the XRF trace table now resides above the 16MB line and has a fixed size of 64KB.
ZCP	Obsolete because ZCP programs cannot be suffixed.

New system initialization parameters

Table 16 (Page 1 of 8). New system initialization parameters	
Parameter	**Description**
AIEXIT={**DFHZATDX**|name}	Indicates the autoinstall module to be used when autoinstalling VTAM terminals and APPC connections and sessions.
AILDELAY={**0**|hhmmss}	Indicates the delay period to elapse after a session between CICS and an autoinstalled terminal ends and the terminal entry is deleted.
AIQMAX={**100**|number}	Indicates the maximum number of VTAM terminals and APPC connections that can be queued concurrently for autoinstall.
AIRDELAY={**700**|hhmmss}	Indicates the delay period to elapse after emergency restart before autoinstall entries that are not in session are deleted.

Table 16 (Page 2 of 8). New system initialization parameters

Parameter	Description
AUXTR={**OFF**|ON}	Sets the auxiliary trace destination on or off and controls whether CICS system trace, user trace, or exception trace entries are written to the auxiliary trace data set.
AUXTRSW={**NO**|ALL|NEXT}	Sets the trace autoswitch facility on or off.
CDSASZE={**0K**|number}	Specifies the size of the CICS DSA (CDSA). The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
CHKSTRM={**CURRENT**|NONE}	Sets terminal storage-violation checking on or off. Can be used as an alternative to the CICS-supplied transaction, CSFE.
CHKSTSK={ALL|CURRENT|**NONE**}	Sets task storage-violation checking on or off at start up. Can be used as an alternative to the CICS-supplied transaction, CSFE.
CMDPROT={**YES**|NO}	Allows or inhibits validation of start addresses of storage referenced as output parameters on EXEC CICS commands.
CMDSEC={**ASIS**|ALWAYS}	Indicates whether you want CICS to honor the CMDSEC option specified on a transaction's resource definition.
CONFDATA={**SHOW**|HIDETC}	Indicates whether CICS is to hide user data that might otherwise appear in CICS trace entries or in dumps that contain the RAIA. CONFDATA applies to initial input data received on a VTAM RECEIVE ANY operation, on an MRO link, FEPI screens, and RPLAREAs.
CONFTXT={**NO**|YES}	Indicates whether CICS is to prevent VTAM from tracing user data.
CSDACC={**READWRITE**|READONLY}	Indicates the type of CSD access permitted in this CICS region. Effective on a cold start only.
CSDBUFND=number	Indicates the number of buffers to be used for CSD data. Effective on a cold start only and can only be used with the CSDLSRNO=NONE parameter.
CSDBUFNI=number	Indicates the number of buffers to be used for the CSD index. Effective on a cold start only and can only be used with the CSDLSRNO=NONE parameter.
CSDFRLOG=number	Indentifies the journal to be used for forward recovery of CSD. Effective on a cold start only. On a warm or emergency restart, file resource definitions are recovered from the global catalog. CSDFRLOG can only be used if the CSDRECOV=ALL parameter is also coded.
CSDJID={**NO**|number}	Identifies the journal to be used for automatic journaling of file requests against the CSD. Effective on a cold start only. On a warm or emergency restart, file resource definitions are recovered from the global catalog.

Table 16 (Page 3 of 8). New system initialization parameters	
Parameter	**Description**
CSDLSRNO={**1**|number|NO|NONE}	Indicates whether the CSD is to be associated with an LSRpool. Effective on a cold start only. On a warm or emergency restart, file resource definitions are recovered from the global catalog.
CSDRECOV={**NONE**|ALL|BACKOUTONLY}	Indicates whether the CSD is a recoverable file. Effective on a cold start only. On a warm or emergency restart, file resource definitions are recovered from the global catalog.
CSDSTRNO={**2**|number}	Indicates the number of concurrent requests that can be processed against the CSD. Effective on a cold start only. On a warm or emergency restart, file resource definitions are recovered from the global catalog.
CWAKEY={**USER**|CICS}	Indicates the storage key for the CWA if CICS storage protection is active (STGPROT=YES).
DFLTUSER={**CICSUSER**|userid}	Associates the ESM userid with the security attributes to be used for all terminal users who are not explicitly signed on.
DISMACP={**YES**|NO}	Disables any transaction that terminates abnormally with an ASRD abend. Is ineffective if an ASRD abend is handled by an active abend exit.
DSALIM={**5M**|number}	Specifies the upper limit of the total amount of storage within which CICS can allocate the individual DSAs that reside below the 16MB line.
DSHIPIDL={**020000**|hhmmss}	Indicates the minimum time that an *inactive* shipped terminal definition must remain installed in this region. When the timeout delete mechanism is invoked, only those shipped definitions that have been inactive for longer than the specified time are deleted.
DSHIPINT={**120000**|0|hhmmss}	Indicates the interval between invocations of the timeout delete mechanism. The timeout delete mechanism removes any shipped terminal definitions that have not been used for longer than the time specified.
DTRTRAN={**CTRX**|name}	Identifies the transaction definition required for dynamic transaction routing. CTRX is the name of the new transaction available to define a dynamic transaction routing definition. The default sample, CTRX, is provided in the CSD group, DFHISC.
DUMPDS={**AUTO**|A|B}	Specifies the transaction dump data set to be opened during CICS initialization.
DUMPSW={**NO**|NEXT}	Indicates whether CICS is to switch automatically to the next dump data set when the first becomes full.
ECDSASZE={**0K**|number}	Specifies the size of the ECDSA. The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
EDSALIM={**20M**|number}	Specifies the upper limit of the total amount of storage within which CICS can allocate individual extended DSAs above the 16MB line.

Table 16 (Page 4 of 8). New system initialization parameters	
Parameter	**Description**
EODI={**EO**|xx}	Indicates the end-of-data indicator for input from sequential terminals.
ERDSASZE={**0K**|number}	Specifies the size of the ERDSA. The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
ESDSASZE={**0K**|number}	Specifies the size of the ESDSA. The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
ESMEXITS={**NOINSTLN**|INSTLN}	Specifies whether installation data is to be passed via the RACROUTE interface to the ESM manager for use in exits written for the ESM.
EUDSASZE={**0K**|number}	Specifies the size of the EUDSA. The default size is 0 indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
FEPI={**NO**|YES}	Indicates whether FEPI is required. FEPI=YES causes CICS to start the FEPI transaction, CSZI.
FSSTAFF={**NO**|YES}	Specifies whether function-shipping START affinity support is required in an AOR.
GNTRAN={**CESF**|transaction-id}	Identifies the transaction CICS is to invoke when a user's terminal-timeout period expires.
INITPARM=(pgname_1='parmstring_1'[, ... ,pgname_n= 'parmstring_n'])	Passes parameters to applications that use the ASSIGN INITPARM command. The area giving access to the parameters is specified by the ASSIGN INITPARM command.
INTTR={**ON**|OFF}	Indicates whether the internal CICS trace destination is to be activated at system initialization and controls whether CICS system trace, user trace, or exception trace entries are written to the internal trace table.
MN={**OFF**|ON}	Indicates whether CICS monitoring is to be activated at initialization.
MNCONV={**NO**|YES}	Specifies whether conversational tasks are to have separate performance class records produced for each pair of terminal control I/O requests. Any clock active at the time such a performance class record is produced is stopped immediately before the record is written (this includes user-defined clocks).
MNEXC={**OFF**|ON}	Indicates whether the monitoring exception class is to be activated during system initialization. The monitoring status class is recorded in the CICS global catalog for use during warm and emergency restarts.
MNFREQ={**0**|hhmmss}	Specifies the interval for which CICS automatically produces transaction performance class records for any long-running transaction. The monitoring frequency value is recorded in the CICS global catalog for use during warm or emergency restarts.

Table 16 (Page 5 of 8). New system initialization parameters

Parameter	Description
MNPER={**OFF**|ON}	Indicates whether the monitoring performance class is to be activated during CICS initialization. The monitoring performance class status is recorded in the CICS global catalog for use during warm or emergency restarts.
MNSYNC={**NO**|YES}	Specifies whether a transaction performance class record should be produced when a transaction takes an implicit or explicit syncpoint. No action is taken for syncpoint rollbacks. The monitoring syncpoint status is recorded in the CICS global catalog for use during warm or emergency restarts.
MNTIME={**GMT**|LOCAL}	Specifies whether the time stamp fields in performance class monitoring data will be returned to an application using the EXEC CICS STATISTICS MONITOR(*taskno*) command in GMT or local time. The monitoring time value is recorded in the CICS global catalog for use during warm and emergency restarts.
MROFSE={**NO**|YES}	Specifies whether you want to extend the lifetime of the long-running mirror task to the end of the user task.
MSGCASE={**MIXED**|UPPER}	Indicates whether the message domain is to display messages in upper or lowercase.
NEWSIT={**NO**|YES}	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 via PARM, SYSIPT, or the system console).
PARMERR={**INTERACT**|IGNORE ABEND}	Indicates the action CICS should take if incorrect system initialization overrides are detected during initialization. It only affects subsequent SIT overrides.
PGAICTLG={**MODIFY**|NONE|ALL}	Indicates whether autoinstalled program definitions are to be cataloged. When CICS is running, you can catalog autoinstalled programs dynamically using an EXEC CICS SET SYSTEM or CEMT SET SYSTEM command.
PGAIEXIT={**DFHPGADX**|NAME}	Identifies the autoinstall exit program. When CICS is running, you can catalog autoinstalled programs dynamically using an EXEC CICS SET SYSTEM or CEMT SET SYSTEM command.
PGAIPGM={**INACTIVE**|ACTIVE}	Indicates the state of the program autoinstall function at initialization. When CICS is running, you can catalog autoinstalled programs dynamically using an EXEC CICS SET SYSTEM or CEMT SET SYSTEM command.
PLTPISEC={**NONE**|CMDSEC|RESSEC|ALL}	Indicates whether or not CICS is to perform command security checking for PLT programs during CICS initialization.

Table 16 (Page 6 of 8). New system initialization parameters

Parameter	Description
PLTPIUSR=userid	Identifies the user ID CICS is to use for security checking for PLT programs that run during CICS initialization. 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.
PRTYAGE={**32768**|value}	Sets the priority aging algorithm for incrementing the priority of a task in milliseconds.
PRVMOD={name|(name,name...name)}	Identifies the modules not to be used from the SVA.
PSDINT={**0**|hhmmss}	Specifies how long VTAM is to hold sessions in a recovery-pending state if CICS fails.
PVDELAY={**30**|number}	Specifies how long entries can remain in signed-on-from lists for connections for which persistent verification is specified in a CONNECTION resource definition.
RDSASZE={**0K**|number}	Specifies the size of the read-only DSA (RDSA). The default size is 0, indicating that the DSA size can change dynamically. A non-zero value indicates that the DSA size is fixed.
RENTPGM={**PROTECT**|NOPROTECT}	Specifies whether you want CICS to allocate the RDSA and ERDSA from read-only key-0 protected storage.
RESP={**FME**|RRN}	Specifies the type of request CICS terminal control receives from logical units (function management end (FME) or reached recovery node (RRN)).
RESSEC={**ASIS**|ALWAYS}	Specifies whether or not you want CICS to honor the RESSEC option specified on a transaction's resource definition.
RUWAPOOL={**NO**|YES}	specifies the option for allocating a storage pool the first time an LE program runs in a task.
SDSASZE={**0K**|number}	Specifies the primary extent size of the SDSA.
SEC={**YES**|NO}	Indicates the level of external security required. YES for full security or NO for none.
SECPRFX={**NO**|YES}	Indicates whether or not CICS should prefix the resource names in any authorization requests to a full-function ESM, with a prefix corresponding to the ESM user ID for the CICS region. The prefix to be used is obtained by DFHIRP.
SNSCOPE={**NONE**|CICS|VSEIMAGE|	Specifies whether or not a user ID can be signed on to CICS more than once, within the scope of a single CICS region or a single VSE image.
SPCTR={(**1,2**|1,[,2][,3]) |ALL|OFF}	Sets the level of tracing for all CICS components used by a transaction, a terminal, or both, selected for special tracing.
SPCTRxx={(**1,2**|1,[,2][,3]) |ALL|OFF}	Sets the level of tracing for a particular CICS component used by a transaction, a terminal, or both, selected for special tracing.

Table 16 (Page 7 of 8). New system initialization parameters	
Parameter	**Description**
STATRCD=**OFF**|ON	Sets the statistics recording status at initialization. Status is recorded in the CICS global catalog for use during warm or emergency restarts. Statistics collected are written to a DMF data set.
STGPROT={**NO**|YES}	Activates storage protection in the CICS region. If STGPROT=NO is specified, storage protection is inactive and CICS runs in a single storage key.
STGRCVY={**NO**|YES}	Indicates whether CICS should attempt to recover from a storage violation. Either way, CICS continues unless you specify that CICS should terminate (in the dump table).
STNTR={**1**|(1[,2][,3])|ALL|OFF}	Indicates the level of standard tracing required for CICS as a whole. Up to 3 levels of tracing can be selected, but some CICS components do not have trace points at all these levels.
STNTRxx={**1**|(1[,2][,3])|ALL|OFF}	Indicates the level of standard tracing required for a particular CICS component. The component is identified by the value of *xx* in the keyword. One STNTR parameter is coded for each component that is to be traced.
SYDUMAX={**999**|number}	Indicates the number of system dumps that can be taken for each dump table entry. If this number is exceeded, subsequent dumps are suppressed.
SYSTR={**ON**|OFF}	Controls the master system trace flag, and obtains entries of CICS system activity. Entries are written to all active trace destinations.
TCSACTN={**NONE**|UNBIND}	Indicates the action terminal control should take if the terminal control shutdown wait threshold expires. Applies to VTAM terminals (including LU Type 6.2 single-session APPC terminals) but not to VTAM intersystem connections (LU Type 6.1 and LU Type 6.2 parallel connections). Use with the TCSWAIT parameter.
TCSWAIT={**4**|number|NO|NONE|0}	Specifies the CICS terminal control shutdown threshold. The wait threshold is the time (during shutdown) that CICS terminal control allows to pass before it considers terminal shutdown to be hung.
TCTUAKEY={**USER**|CICS}	Specifies the storage key for the TCTUAs if storage protection is active. TCTUAKEY is ignored if storage protection is inactive.
TCTUALOC={**BELOW**|ANY}	Indicates where TCTUAs should be stored. Above the 16MB line is the preferred location.
TRDUMAX={**999**|number}	Specifies the number of transaction dumps that may be taken for each dump table entry. If this number is exceeded, subsequent dumps are suppressed.
TRTABSZ={**16**|number-of-kilobytes}	Identifies the size of the internal trace table. The CICS trace table is allocated in virtual storage above the 16MB line **before** the ECDSA and the EUDSA.
TRTRANSZ={**40**|number-of-kilobytes}	Indicates the size of the transaction dump trace table.

Table 16 (Page 8 of 8). New system initialization parameters

Parameter	Description
TRTRANTY={**TRAN**|all}	Identifies the trace entries to be copied from the internal trace table to the transaction dump trace table.
TSMGSET={**4**|number}	Identifies the number of entries for which dynamic storage is allocated for storing pointers to records put into the temporary storage message set.
UDSASZE={**0K**|number}	Specifies the primary extent size of the UDSA.
USERTR={**ON**|OFF}	Sets the master trace flag on or off. If the trace flag is off, the user trace facility is disabled and CICS ignores EXEC CICS ENTER TRACENUM commands.
USRDELAY={**30**|number}	Specifies the maximum time that an eligible user ID and its attributes are to be retained in the user table if the user ID is unused.
XAPPC={**NO**|YES}	Specifies whether ESM security can be used when establishing APPC sessions.
XCMD={**NO**|name|YES}	Specifies whether CICS is to perform command security checking. Checking is only performed if SEC=YES is also specified, and the CMDSEC=YES option is specified on the TRANSACTION resource definition.
XRFSOFF={**NOFORCE**|FORCE}	Specifies whether all users signed on to the active CICS region are to remain signed on following a takeover. Applicable only if XRF=YES is also coded.
XRFSTME={**5**|decimal-value}	Specifies the timeout delay interval for users who are still signed on when an XRF takeover occurs.
XUSER={**NO**|YES}	Specifies whether or not CICS is to perform surrogate user checks.

Changed system initialization parameters

Table 17 (Page 1 of 3). Changed system initialization parameters	
Parameter	**Change**
APPLID={**DBDCCICS**| applid|(generic-applid,specific-applid)}	Generic and specific applids cannot be the same.
BMS=()MINIMUM|STANDARD|**FULL**}[,COLD] [,{**UNALIGN**|ALIGN}] [,{**DDS**|NODDS}])	You cannot define 3270 display units and printers as DEVICE(SCSPRINT) on the RDO TYPETERM definition. Full or standard BMS is only needed if XRF is active, and MESSAGE for RECOVNOTIFY is specified on any TYPETERM definitions. BMS=FULL is needed for the report controller.
DATFORM={**MMDDYY**|DDMMYY|YYMMDD}	CICS maintains the external date display in the form 0CYYDDD, where C=0 represents years 19xx, C=1 for years 20xx, and so on. YY=year of the century; and DDD=day of the year. CICS converts the date to the format you specify.

Table 17 (Page 2 of 3). Changed system initialization parameters

Parameter	Change
DBP={1$\|2$|xx|YES}	There is no default and the DBP parameter must be coded explicitly, otherwise the assembler returns an error (MNOTE 8). You can no longer code DBP=NO.
DUMP={**YES**|NO}	SDUMPs are produced if DUMP=YES is specified (unless suppressed by system dump table options or system defaults). If DUMP=NO is specified, SDUMPs are suppressed.
DUMPDS={**AUTO**|A|B}	AUTO opens the dump data set for all types of start.
FCT={**YES**|xx|NO}	Effective on a cold start only.
GMTEXT={**WELCOME TO CICS**|'text'}	Change to default good morning message text.
GRPLIST={**DFHLIST**|name|(name[,name2][,name3][,name4])}	Up to four lists of resource definition groups can be named. If more than one group list is specified, the later group lists are concatenated into the first group list. Any duplicate resource definitions in later lists override those in earlier lists.
ICVTSD={**5000**|number}	The range is now 0 through 5000 milliseconds.
JSTATUS=RESET	JSTATUS only resets the journal status of data sets defined on disk (JTYPE=DISK1|DISK2), with the JOUROPT=AUTOARCH option **not** coded. JSTATUS does not apply if automatic archiving is active.
MXT={**5**|number}	The range is now 1 through 999. MXT refers only to user tasks and does not include system tasks.
PRINT={**NO**|YES|PA1|PA2|PA3}	When YES, PA1, PA2, or PA3 is specified, transaction CSPP is initiated which in turn invokes program DFHP3270. Transaction and programs are now defined in the CSD group, DFHHARDC. For 3270 and LUTYPE2 LUs, the resources defined in group DFHVTAMP are required.
SRT={**YES**|NO|xx}	CICS now issues ESTAEX macros to intercept program checks.
START=({**AUTO**|COLD|STANDBY|LOGTERM|}[,ALL])	Use the new LOGTERM option as an alternative to a full emergency restart when the previous run terminates in an uncontrolled shutdown. LOGTERM is only available if the CICS system log is defined on disk data and if XRF=NO is coded.
SYSIDNT={**CICS**|name}	SYSIDNT can now only be updated on a cold start.
TBEXITS=([name1][,name2][,name3][,name4])	The name5 option is no longer valid. If TBEXITS are not needed, you can either omit the parameter altogether or code it as TBEXITS=(,,,).
TCP={**YES**|NO}	Suffix numbers are no longer valid.
TD=({**3**|decimal-value-1)([{**3**|decimal-value-2}])	The range for decimal-value-1 is now 1 through 32767. More buffers may be allocated than are specified, depending on the CI size defined in the intrapartition data set.
TS=([COLD][,}0|**3**|decimal-value-1}][,{**3**|decimal-value-2}])	The range for decimal-value-1 is now 3 through 32767. More buffers may be allocated than are specified, depending on the CI size defined in the auxiliary temporary storage data set.

4
4
4

Table 17 (Page 3 of 3). Changed system initialization parameters	
Parameter	**Change**
VTPREFIX={|character}	This keyword replaces the VTPRFX introduced in CICS for VSE/ESA Version 2.3. It specifies the first character to be used for the terminal identifiers (termids) of autoinstalled virtual terminals. CICS continues to support the old keyword for compatibility purposes, but you are recommended to use the new keyword when reassembling your system initialization tables.
XDCT={**NO**|name|YES}	Specifies whether CICS is to perform transient data resource security checking, and, optionally, the ESM resource class name in which the TD resource security profiles have been defined.
Note: Checking is performed for XDCT, XFCT, XJCT, XPCT, XPPT, and XTST only if YES is specified for the SEC system initialization parameter, and RESSEC(YES) is specified on the appropriate resource definition. These parameters can be coded in the SIT, PARM, and SYSIPT only.	
XFCT={**NO**|name|YES}	Specifies whether CICS is to perform file resource security checking, and, optionally, the ESM resource class name in which the file resource security profiles have been defined.
XJCT={**NO**|name|YES}	Specifies whether CICS is to perform journal resource security checking, and, optionally, the ESM resource class name in which the journal resource security profiles have been defined.
XPCT={**NO**|name|YES}	Specifies whether CICS is to perform started transaction resource security checking, and, optionally, the ESM resource class name in which the started transaction security profiles have been defined.
XPPT={**NO**|name|YES}	Specifies whether CICS is to perform program resource security checking, and, optionally, the ESM resource class name in which the program resource security profiles are defined.
XTST={**NO**|name|YES}	Specifies whether CICS is to perform temporary storage security checking, and, optionally, the ESM resource class name in which the temporary storage security profiles are defined.

Migration planning summary

In summary, system initialization now takes place using standardized CICS interfaces that provide an improved method of communicating between functional areas of CICS.

The key points to remember are:

- There are now two phases of PLT processing during initialization.

- The way in which CICS loads the PLT is changed. Therefore you no longer need a program resource definition for the PLT itself, and should remove any existing definitions.

- First-phase PLTPI programs must run in AMODE(31).

- First-phase PLTPI programs can issue only a subset of EXEC CICS commands.

- To migrate a PLT from CICS for VSE/ESA Version 2.3, reassemble the PLT with a PROGRAM=DFHDELIM statement included in the appropriate place.

- System intialization overlays are obsolete.

- CICS initializes the CPI-C environment and the LE/VSE interface automatically.

- There are many system initialization parameter changes.

Chapter 12. CICS system data sets

This chapter covers new and changed CICS system data sets, as follows:

- "New CICS data sets"
- "Changes to existing CICS data sets" on page 81

New CICS data sets

The following CICS data sets are new:

- The local and global catalogs
- The automatic journal archiving data sets
- Data Management Facility data sets

The CICS local and global catalogs

Two separate VSAM data sets are used for cataloging information about the running CICS system. CICS no longer uses part of the restart data set (RSD) as in previous versions. The new catalog data sets are VSAM key-sequenced data sets with a 28-byte key length. One of the data sets contains the local catalog and the other contains the global catalog. Each data set requires a DLBL statement to define it either in the CICS startup JCL or in the appropriate dynamic class or partition label subarea. The file names are DFHLCD for the local catalog, and DFHGCD for the global catalog. The catalogs contain system information for use in warm and emergency restarts, including takeovers by an alternate CICS region when running with XRF. The global catalog can also contain information that is used in a cold start.

If you delete and redefine either catalog for any reason, you must delete and redefine them both.

For more information about these catalogs and how to estimate the correct sizes for your installation, see the *CICS System Definition Guide*.

Changes to the use of the restart data set

The name DFHRSD now refers to a data set that is used only for system log processing during emergency restart.

If you are accustomed to redefining a new RSD for cold-start performance reasons, you should not continue this practice by deleting the global catalog for cold starts.

The automatic journal archiving data sets

If you decide to use the new CICS automatic journal archiving facility to archive CICS journals instead of the user-replaceable programs DFHXJCC and DFHXJCO, you need to define the new DFHJACD journal archive control data set.

For more information about this new data set, and about the new automatic archiving facility, see the *CICS System Definition Guide*.

The Data Management Facility (DMF) Data Handler data sets

Statistical and monitoring data is written to Data Management Facility (DMF) Data Handler data sets.

All the DMF records written by CICS conform to the System Management Facility (SMF) format for the SMF header and SMF product section, including the use of record sub-types. This means that CICS monitoring, statistics, and journaling can all output SMF type 110 records. The record sub-type field in the SMF header part of each SMF type 110 record can be used to identify the type of data in the record (for example, the sub-type for the CICS statistics record is X'0002'). For information about SMF record types and formats, see *OS/390 MVS System Management Facilities (SMF)*, GC28-1783.

4
4

DMF requires that its data sets be defined using IDCAMS services, and formatted using the DFHDFOU utility.

DMF runs in a separate partition, and CICS can be started without DMF being active.

See the *CICS System Definition Guide* for information about defining and formatting DMF data sets.

Effects on CICS monitoring

CICS monitoring domain outputs SMF type 110 records; CICS monitoring data being identified by SMF sub-type X'0001'.

3

Because the MN domain writes to DMF data sets, ensure that your DMF data sets are large enough to accommodate the volume of CICS data. When you calculate the size of your DMF data sets, remember to take into account space for CICS statistics data, which are also written to DMF data sets. See the *CICS Customization Guide* for details of CICS monitoring records and their sizes.

Effects on CICS statistics

Because statistics are written to DMF data sets, separate CICS data sets for statistical information are not required. Remove DLBL statements for DFHSTM and DFHSTN from your CICS startup job stream.

The statistics queues, CSSM and CSSN, are also removed. Reassemble your destination control table (DCT) without definitions for CSSM and CSSN.

Each statistics record contains an SMF header, an SMF product section, and one CICS data section. A new field in the SMF product section gives the time that CICS last reset the statistics counters.

CICS passes more information to your global user exits. The DFHUEPAR parameters include the following SMF product section fields as XSTOUT exit-specific parameters:

- The collection date in the form mmddyy or mmddyyyy
- The collection time in the form hhmmss
- The length of the interval in the form hhmmss
- The interval number

Because the ST domain writes to DMF data sets, ensure that your DMF data sets are large enough to accommodate the volume of CICS data. When you calculate the size of your DMF data sets, remember to take into account space for CICS monitoring data, which is also written to SMF data sets. See the *CICS Performance Guide* for details of CICS statistics records and their sizes.

3

Changes to existing CICS data sets

The ways in which you can use the following data sets are changed:

- The DFHCXRF extrapartition transient data set
- The CICS system definition (CSD) file
- Dump data sets

The DFHCXRF transient data extrapartition data set

In CICS for VSE/ESA Version 2.3, when transient data initialization is suspended pending a takeover, only an XRF-alternate CICS system can write to the CXRF destination, because CXRF is available at a time when other transient destinations are not.

The CXRF destination is now used by all CICS systems (non-XRF CICS regions, and both active and alternate regions in an XRF environment) when there is a need to write to transient data destinations during CICS startup, before transient data initialization has completed.

See the *CICS System Definition Guide* for more information about the CXRF queue, and its associated DLBL statement (DFHCXRF).

Changes to the CICS system definition (CSD) file

You cannot define the CSD:

- In the FCT
- In the CSD itself

You define the file control attributes of the CSD using a set of new system initialization parameters:

```
CSDACC
CSDBUFND
CSDBUFNI
CSDFRLOG
CSDJID
CSDLSRNO
CSDRECOV
CSDSTRNO
```

These CSD parameters are effective only on a CICS cold start–the parameters are ignored for all other types of restart.

From these system initialization parameters, CICS dynamically builds an entry for the CSD in the file control table. This information is cataloged and reused in any subsequent warm or emergency restart.

The CSD*xxxxx* system initialization parameters are described in the *CICS System Definition Guide*.

VSE SDUMP and CICS transaction dump data sets

CICS uses two types of dump data set to record the dumps produced when a failure is detected during CICS execution or as a result of an explicit request:

VSE system dump libraries

> The VSE dump libraries hold the system dumps (SDUMPs) as library members requested by CICS using the VSE SDUMPX macro.

CICS transaction dump data sets

> These data sets hold only transaction dumps. Formatted, snap, region, and storage violation dumps are now produced as SDUMPs.

For more information about the VSE system dump libraries and how to use them, see the *VSE/ESA Guide for Solving Problems* and the *VSE/ESA Diagnosis Tools* manual.

Because CICS system dumps are now always written to VSE system dump libraries, you must recalculate the space required for each one. This is especially important as, in general, system dumps are larger than in previous versions of CICS.

In previous releases of VSE/ESA, if the SYSDUMP library is full, subsequent SYSDUMPs are rerouted to SYSLST. Because rerouting SYSDUMPs significantly delays the running of CICS (the partition is stopped while the SDUMP is taken), and because a SYSLST SDUMP cannot be analyzed using the CICS INFO/ANA exit, you can suppress the rerouting operation using the VSE/ESA // OPTION statement parameter, SYSDUMPC. See the *VSE/ESA System Control Statements* manual for more information about the // OPTION statement.

CICS records its transaction dumps on a sequential data set, which can be on tape or disk. At least one transaction dump data set (with the file name DFHDMPA) must be available for opening at CICS initialization. The other data set (with the file name DFHDMPB) is optional. For information about defining transaction dump data sets, see the *CICS System Definition Guide*.

Migration planning summary

The key points to remember are that you need to:

- Define the new CICS local and global catalog data sets.

- Redefine the restart data set.

- Review the changes made to the special transient data extrapartition data set, DFHCXRF. DFHCXRF is now used by both active and alternate CICS systems, and also by non-XRF CICS systems.

- Define some new CICS system data sets for use with the new CICS automatic journal archiving facility if you decide to stop archiving CICS journals with DFHXJCC and DFHXJCO.

- Remove the definition of the CICS system definition (CSD) file from the FCT and define your CSD using the new CSD*xx* system initialization parameters instead.

- Examine your CICS dump requirements, and define your needs using the new dump table options.
- Recalculate the space needed for some of your VSE system data sets and other non-CICS data sets.

Table 18. Resource definition road map	
If you want to...	**Refer to...**
Use the CSD for VSAM files, remote files, data tables, and LSR pools	"Using the CSD for VSAM files, remote files, data tables, and LSR pools" on page 88.
Upgrade a CSD used in an earlier release of CICS	"Upgrading your CSD" on page 89.
Share a CSD between 2 or more CICS regions	"Sharing your CSD" on page 90.
Migrate PPT and PCT table definitions to the CSD	"Migrating PPT and PCT table definitions to the CSD" on page 89.
Migrate TCT table definitions to the CSD	"The terminal control table (DFHTCT) macros" on page 112.
Migrate FCT table definitions to the CSD	"Migrating VSAM file definitions to the CSD" on page 88.
Know about compatibility groups	"Compatibility groups" on page 90.
Know about changes made to the DFHCSDUP utility program	"Changes to the DFHCSDUP utility program" on page 91.
Know more about the changes made to IBM-supplied CSD groups	Appendix B, "Summary of changes to the IBM-supplied RDO groups" on page 233.
Know more about the changes made to IBM-supplied TYPETERM groups	"Changes to IBM-supplied model terminal definitions for autoinstall, DFHTERM" on page 248.
Know more about the changes made to the individual resource definitions,	The section starting at "Changes to the CONNECTION definition" on page 93. and ending at "Changes to the TYPETERM definition" on page 102.
Know more about the changes made to the various table macros	Chapter 14, "Macro resource definition" on page 105.

Chapter 13. Resource definition online

This chapter describes the changes made to resource definition online (RDO).

The CICS system definition (CSD) file

The following macro-generated control tables are obsolete, making the use of a CSD mandatory for the most commonly used resources:

Control table	*Resource*
DFHPCT	Transactions and transaction profiles
DFHPPT	Programs, map sets, and partition sets for basic mapping support
DFHTCT	The following definitions:

- VTAM-connected terminals (autoinstall and non-autoinstall definitions)
- VSE consoles for use as CICS terminals
- Multiregion operation (MRO)
- Intersystem communication (ISC) links and sessions using LU6.1 and APPC (LU6.2) protocols
- Indirect connections

For VSAM files, remote files, data tables, and LSR pool resource definitions you can use either the CSD or an FCT. However, some keywords, such as the recovery keywords for forward recovery logging, can only be specified in the CSD.

If you are not already doing so, consider using the CSD for all the CSD-supported resource definitions with CICS for VSE/ESA Version 2.3. This simplifies the task of migrating, after which the use of a CSD is mandatory for many resources.

The obsolete macros DFHPCT and DFHPPT are supplied for CSD-migration purposes only. You can migrate these and other CSD-supported tables to the CSD using the MIGRATE function of the DFHCSDUP utility program. Before migrating tables in this way, reassemble them against the VSE/ESA Version 2 Release 4 sublibrary PRD1.BASE.

On a cold start, CICS obtains the following resource definitions only from the CSD:

- Transaction definitions
- Program definitions
- VTAM terminal definitions
- VTAM-connected terminals
- Indirect connections
- VSE console definitions
- MRO and ISC SESSION and CONNECTION definitions

For more information about defining resources using RDO, see the *CICS Resource Definition Guide*.

Using the CSD for VSAM files, remote files, data tables, and LSR pools

You can use the CSD to define VSAM files, remote files, data tables, and local shared resource (LSR) pools. Use the DFHCSDUP utility program to migrate your current file control table entries for these resources to the CSD.

See the *CICS Resource Definition Guide* for more information about DEFINE commands for VSAM files, remote files, data tables, and LSR pools.

Migrating VSAM file definitions to the CSD

CICS continues to support file control tables (FCTs) for VSAM objects (files, data tables, or shared resources pools). However, you are strongly recommended to migrate these definitions to the CSD, to obtain the benefits of online definition. Future releases of CICS will support only online definition for these resources.

To migrate your VSAM file definitions to the CSD, specify the MIGRATE=YES option and reassemble the FCT against the VSE/ESA Version 2 Release 4 sublibrary PRD1.BASE. When the table is reassembled, use the MIGRATE command of the DFHCSDUP utility program to complete the migration.

After migration, you can continue to use the FCT for DAM files. To enable you to use a migrated FCT, specify the MIGRATE=COMPLETE option on the TYPE=INITIAL entry of the FCT, to exclude the migrated VSAM definitions from the assembled tables, and reassemble the FCT again. For example:

```
 DFHFCT          TYPE=INITIAL,
                 SUFFIX=xx,
                 MIGRATE=COMPLETE
```

Note: If you do not exclude the VSAM entries after migration errors can occur during resource installation as a result of duplicate definitions installed from the two sources—CSD and FCT. In particular, if the FCT entry specifies FILESTAT=ENABLED, the installation of the CSD definition will fail.

CICS installs file control definitions from the FCT and CSD only on a cold start. For other types of restart, the FCT and CSD are is ignored and CICS installs the definitions from the global catalog, DFHGCD.

Reassembling file control tables

If you continue using your existing FCTs during the early period of migration, perhaps using the CSD only for new files, remove the CSD entry from the FCT source statements, and reassemble the tables. You cannot specify the CSD in an FCT. Failure to remove CSD entries from old FCTs causes an MNOTE during assembly. See "Changes to the CICS system definition (CSD) file" on page 81 for more information.

Reassemble all tables using the CICS TS Release 1 macros, which are shipped as part of the PRD1.BASE.

Migrating PPT and PCT table definitions to the CSD

Migrate your PCT and PPT definitions to the CSD. These tables cannot be used for CICS initialization. The DFHPPT and DFHPCT macros are supported only for migration purposes. Specify MIGRATE=YES on the TYPE=INITIAL entry, assemble your PPTs and PCTs using the latest macros, then use the DFHCSDUP utility program to migrate the assembled tables to the CSD. For more information about migrating PCT and PPT definitions to the CSD, see the *CICS Resource Definition Guide*.

In the case of the PPT, you can use the new autoinstall facility for programs and mapsets as an alternative to migrating the table. See the *CICS Resource Definition Guide* for more information about autoinstall.

Using DFHCSDUP to modify CSD definitions

The DFHCSDUP utility program now supports the ALTER command, providing an alternative to the CEDA and CEDB transactions for modifying definitions.

After using DFHCSDUP to alter or define resources, use the CEDA INSTALL transaction to install the resource definitions in a running CICS region, or perform a cold start with a group list that contains the new or changed definitions.

Upgrading your CSD

If you have used a CSD with CICS for VSE/ESA Version 2.3, you do not need to recreate your CSD file to migrate. To get the new and changed CICS-supplied resource definitions, upgrade your CSD using the DFHCSDUP UPGRADE command.

Upgrading is a single-stage process, carried out on your existing CSD. You might want to make a backup of your CSD before you run the upgrade job.

The UPGRADE command works only on IBM-supplied groups with names beginning with the letters DFH. It does not operate on your own versions of IBM-supplied resource definitions that you have copied to different groups. Replace these private versions from the upgraded IBM-supplied versions and modify them again to ensure that the necessary upgrade changes are carried out. Using resource definitions that have not been upgraded can have unpredictable results.

It is important to upgrade modified definitions to ensure that they are defined correctly with non-default values for new attributes. If you fail to upgrade modified definitions, CICS assigns default values to any new attributes, which might be inappropriate for CICS-supplied resource definitions.

Review all the CSD group lists that you use for CICS startups and ensure that obsolete groups are removed, and that groups supporting new function are added to your lists.

Use the sample JCL shown in Figure 10 for the UPGRADE job, editing it as necessary. The job step executes the CSD utility program, DFHCSDUP, to upgrade the CSD with the additional definitions you need.

```
// JOB UPGRADE
// LIBDEF PHASE,SEARCH=PRD1.BASE
// DLBL DFHCSD,'CICS410.DFHCSD',,VSAM,CAT=CICSUCT
// EXEC DFHCSDUP,SIZE=DFHCSDUP
   UPGRADE
   LIST ALL OBJECTS
/*
/&
```

Figure 10. Sample CSD upgrade job

Note: If you run the UPGRADE job more than once on the same CSD,
DFHCSDUP issues a series of error messages. These messages are
caused by DFHCSDUP trying to create some new groups that were created
the first time you upgraded the file. If this situation occurs you can ignore
the error messages, but it is better to run the upgrade job only once (and
avoid the need to investigate the cause of the error messages).

When upgrading your CSD using the DFHCSDUP UPGRADE command,
DFHCSDUP issues a warning message from the upgrade job if a particular group
cannot be deleted. You can ignore such warning messages if they refer to groups
that were deleted from your CSD by previous release upgrades. (The UPGRADE
command operates by deleting all the IBM-supplied groups that were current in all
earlier releases, and then reinitializing only those that are relevant to the current
release.)

Sharing your CSD

If you want to share your CSD between CICS TS Release 1 and CICS for
VSE/ESA Version 2.3, note of the information about changed and obsolete
keywords given in Appendix B, "Summary of changes to the IBM-supplied RDO
groups" on page 233. CICS continues to show obsolete keywords on CEDx
panels, displayed as protected fields. If you are sharing a CSD between CICS TS
Release 1 and CICS for VSE/ESA Version 2.3, you can change the information in
these protected fields when you are in ALTER mode by pressing the "compatibility"
mode key (PF2).

When sharing your CSD between different releases of CICS, you must make all
modifications to your CSD from the higher-level region. Ensure the PTF for APAR
PQ23273 is applied to all CICS for VSE/ESA Version 2.3 regions to prevent
accidental modification of CSD definitions from a CICS for VSE/ESA Version 2.3
region.

Compatibility groups

If, after upgrading your CSD, you plan to share your CSD with a CICS for VSE/ESA
Version 2.3 system, include the appropriate DFHCOMP*x* compatibility groups in the
startup group list for your CICS for VSE/ESA Version 2.3 regions.

The compatibility groups are as shown in Table 19.

Table 19. Compatibility groups	
Group name	**Description**
DFHCOMP1	Add DFHCOMP1 to your startup group list for any CICS for VSE/ESA Version 2.3 region sharing a CSD. It contains the definitions for the CICS for VSE/ESA Version 2.3 resources changed or made obsolete. **Do not** add DFHCOMP1 to any of your CICS TS Release 1 group lists.
DFHCOMP2	Optional. Add DFHCOMP2 to your startup group list for CICS for VSE/ESA Version 2.3 if you use the report controller.

Changes to the DFHCSDUP utility program

DFHCSDUP is changed so that it is no longer necessary to calculate the value required on the SIZE parameter of the // EXEC statement of a DFHCSDUP job. You can now run DFHCSDUP with an EXEC statement as follows:

```
// EXEC DFHCSDUP,SIZE=DFHCSDUP,PARM='...'
```

Opening the CSD in READONLY or READWRITE mode

You can specify a PARM parameter on the // EXEC DFHCSDUP statement to specify whether you want the CSD opened in READONLY or READWRITE mode. If you specify READONLY, you can run DFHCSDUP with command options that require only read access (such as the LIST function), and share the CSD with a CICS region that is running CED*x* transactions. When you apply the PTF for APAR PQ23273, this function is also available on CICS for VSE/ESA Version 2.3.

Recoverability enhancements to DFHCSDUP

A recoverability environment is introduced for DFHCSDUP in a new interface that enables you to call DFHCSDUP from a user-written program. Adding this recoverability environment means that VSE intercepts abend processing, and passes control to an internal recovery routine. After attempting to perform various clean-up operations, the recovery routine returns control to the invoker of DFHCSDUP with return code 16. (In earlier versions, DFHCSDUP issued a return code following an abend that described the abend.)

See the *CICS Customization Guide* for more information about invoking DFHCSDUP from a user-written program.

Changes to the field size for page numbers in DFHCSDUP listings

As a result of introducing the new recoverability interface, the field size for the page numbers on DFHCSDUP listings is reduced. It is now four numeric characters (maximum 9999), not five as in previous releases.

You can also set the number of lines per page for DFHCSDUP listings, in the range 4 to 9999 (the default is 60). You specify the number of lines on the PAGESIZE parameter, either on the PARM string of the DFHCSDUP EXEC statement, or on the OPTIONS string if you are invoking DFHCSDUP from a user-written program.

See the *CICS Customization Guide* for information about passing parameters to DFHCSDUP from a user-written program.

See the *CICS Operations and Utilities Guide* for information about the parameters you can pass to DFHCSDUP on the PARM string of the EXEC statement.

Changes to the operation of the INSTALL command

In CICS for VSE/ESA Version 2.3, the RDO INSTALL command operates only on groups. CICS commits installed resources at the group level. If CICS cannot install a resource within the group, it backs out those resources already installed, and therefore the entire install operation fails.

This is changed, so that if the INSTALL command fails while installing the group, those resource types committed at the group level are backed out, whereas those resource types committed at the individual resource level remain installed.

The following resource types are committed by individual resource, and not by complete group. The effect of a partially successful INSTALL is to leave those resources that were added in a committed state:

- AUTINSTMODEL
- PROFILE
- PROGRAM
- MAPSET
- PARTITIONSET
- PARTNER
- TRANCLASS
- TRANSACTION
- FILE
- LSRPOOL

The following resources are committed at the group level and are backed out after a partially successful INSTALL:

- CONNECTION
- SESSIONS
- TERMINAL
- TYPETERM

Dynamic backout program

Protect the integrity of your CSD resource definitions, when using the CEDA transaction, by specifying the suffix of a CICS dynamic transaction backout program on the DBP system initialization parameter. Specify either the pregenerated version DFHDBP1$ (DBP=1$) if you are not using CICS with DL/I, or DFHDBP2$ (DBP=2$) if you are.

A dynamic backout program is mandatory. Therefore, the NO option is withdrawn from the DBP system initialization parameter. Note there is no default for the DBP system initialization parameter, and the assembler returns an MNOTE error if the parameter is omitted, and the table assembly fails.

Changes to the IBM-supplied CSD groups

For a summary of the changes made to the IBM-supplied CSD groups, see Appendix B, "Summary of changes to the IBM-supplied RDO groups" on page 233.

Changes to the CONNECTION definition

Table 20. Changes to the CONNECTION definition		
Operand	**Change**	**Description**
ATTACHSEC	Changed	Indicates the level of attach-time user security for the connection. Support for persistent sessions is added.
BINDSECURITY	New	Indicates whether an external security manager is being used for bind-time security.
CONNTYPE	New	Indicates the type of external CICS interface (EXCI) connection being used.
DESCRIPTION	New	Use it to provide a description of the resource you are defining.
MAXQTIME	New	Specifies the maximum time that queued requests can wait for free sessions on unresponsive connections.
PROTOCOL	Extended to include the EXCI options	Can be used to specify whether this connection is for use by a non-CICS client program using the EXCI.
PSRECOVERY	New	Specifies the type of recovery for APPC sessions using VTAM persistent sessions.
QUEUELIMIT	New	Specifies the maximum number of allocate requests that CICS is to queue while waiting for free sessions on the connection.
REMOTESYSNET	New	Names the network name (APPLID) of the system that owns the connection.
SECURITYNAME	Obsolete on MRO connections	Can be used for APPC and LU6.1 links only. To specify bind-time and link security for MRO connections, you must define appropriate ESM security profiles.

Rejection of duplicate NETNAMEs on MRO connections

In earlier releases, CICS does not reject MRO connections with duplicate NETNAMEs when the connections are being installed, nor are the duplicate NETNAMEs detected when the CICS region logs on to DFHIRP. You may not be aware that you have installed connections with duplicate NETNAMEs. These cause no error messages, and the connections appear normal when you display them with a CEMT INQUIRE CONNECTION command.

The rules governing the specification of the NETNAME parameter are changed to prevent duplicate MRO NETNAMEs being installed. When connections are being installed, CICS rejects any connection definition with a netname that duplicates an existing MRO netname. Furthermore, changes to DFHIRP ensure that duplicate

NETNAMEs are prevented at IRP logon. This can affect CICS regions at an earlier release level.

For information about the rules governing NETNAMEs on CONNECTION resource definitions, see the *CICS Resource Definition Guide*.

Restrictions when installing CONNECTION definitions

Although there are restrictions in earlier releases concerning some combinations of connection between CICS systems, CICS does not prevent you installing invalid combinations. This is changed, so that:

- You cannot install an APPC CONNECTION resource definition if the connection has the same netname as:
  - Another APPC connection
  - An LU6.1 connection
  - A terminal

- You cannot install a TERMINAL resource definition if the terminal has the same netname as:
  - Another terminal
  - An LU6.1 or APPC (LU6.2) connection

- You cannot install an LU6.1 CONNECTION resource definition if the connection has the same netname as:
  - An APPC connection
  - A terminal

The new FILE definition

Use the FILE resource definition to describe to CICS the physical and operational characteristics of a file.

The following file resources can be defined in the CSD:

- VSAM files
- Remote VSAM files
- Remote DAM files
- VSAM local shared resources (LSRPOOLs)
- Data tables

See the *CICS Resource Definition Guide* for information about the FILE resource definition.

The new LSRPOOL definition

Use the LSRPOOL resource definition to define the size and characteristics of up to 15 local shared resources (LSRPOOLs). Each LSRPOOL is identified by its LSRPOOLID. This ID is used to associate a FILE with an LSRPOOL if that file is to use shared resources. You can now define separate index and data buffer pools within a resource pool. For migration purposes, you can specify only the data buffer pools on the DFHFCT TYPE=SHRCTL macro. After migration, you can tune the LSRPOOLs using the INDEX options to improve VSAM performance.

See the *CICS Resource Definition Guide* for information about the LSRPOOL resource definition.

Changes to the MAPSET definition

The following changes are made to the MAPSET definition:

Table 21. Changes to the MAPSET definition

Operand	Change	Description
DESCRIPTION	New	Provides a description of the resource you are defining.
RSL	Obsolete	Can be used in compatibility mode only.
USAGE	New	Defines when the storage for this map set will be released.
USESVACOPY	New	Defines whether the map set is to be used from the SVA.

Changes to the PARTITIONSET definition

The following changes are made to the PARTITIONSET definition:

Table 22. Changes to the PARTITIONSET definition

Operand	Change	Description
DESCRIPTION	New	Use it to provide a description of the resource you are defining.
RESIDENT	New	Indicates the residence status of the partition set.
RSL	Obsolete	Can be used in compatibility mode only.
USAGE	New	Defines when the storage for this partition set will be released.
USESVACOPY	New	Defines whether the partition set is to be used from the SVA.

The new PARTNER definition

Use the PARTNER resource definition to enable CICS application programs to communicate via APPC protocols to a partner application program running on a remote logical unit. This interaction between a CICS application program and a partner application program is known as a **conversation**.

The PARTNER definition also facilitates the use of a call to the interface with the communications element (CPI-C) System Application Architecture (SAA).

See the *CICS Resource Definition Guide* for information about the PARTNER resource definition.

Changes to the PROFILE definition

The following changes are made to the PROFILE resource definition:

Table 23. Changes to the PROFILE definition		
Operand	**Change**	**Description**
CHAINCONTROL	New	Indicates whether an application program is to control the outbound chaining of request units.
DESCRIPTION	New	Use it to provide a description of the resource you are defining.

Changes to the PROGRAM definition

The following changes are made to the PROGRAM resource definition:

Table 24 (Page 1 of 2). Changes to the PROGRAM definition		
Operand	**Change**	**Description**
CEDF	New	Defines the action of the execution diagnostic facility (EDF) when the program is running under EDF control.
DATALOCATION	New	Commands using the SET option return a data address to an application program; this operand defines the location of that data (below 16MB or ANY).
DESCRIPTION	New	You can use it to provide a description of the resource you are defining.
EXECKEY	New	Indicates the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. For all except reentrant programs, EXECKEY also defines (in conjunction with the RESIDENT operand) which of the DSAs CICS is to load the program.
LANGUAGE	Changed	Now optional, but if specified the only accepted values on the LANGUAGE operand are as follows, with the minimum abbreviation shown in uppercase: • **A**ssembler • **CO**bol • **P**li • **C** The RPG option on the LANGUAGE operand is obsolete and can be used in compatibility mode only.
RSL	Obsolete	Can be used in compatibility mode only.
USAGE	New	Defines when the storage for a program will be released.

Table 24 (Page 2 of 2). Changes to the PROGRAM definition		
Operand	**Change**	**Description**
USESVACOPY	New	Defines whether the map set is to be used from the SVA.

Changes to the SESSIONS definition

The following changes are made to the SESSIONS definition:

Table 25. Changes to the SESSIONS definition		
Operand	**Change**	**Description**
DESCRIPTION	New	Use it to provide a description of the resource you are defining.
OPERID	Obsolete	Can be used in compatibility mode only.
OPERPRIORITY	Obsolete	Can be used in compatibility mode only.
OPERSECURITY	Obsolete	Can be used in compatibility mode only.
OPERRSL	Obsolete	Can be used in compatibility mode only.
PROTOCOL	Extended for the EXCI	Now also indicates if a session is eligible for use by a non-CICS client program using the EXCI. If you specify the EXCI, you must leave the SENDCOUNT operand blank.
RECEIVEPFX and SENDPFX	Changed	You no longer have to specify send and receive prefixes on MRO sessions definitions. See "Change to generation of session names (TCTTE entries)" on page 97 for more information.
RECOVOPTION	Extended for VTAM persistent sessions	See the *CICS Resource Definition Guide* for more information.
SENDCOUNT	Changed	The NO option on the SENDCOUNT operand is replaced by the BLANK option. SENDCOUNT must be blank if the sessions are on an EXCI connection.

Change to generation of session names (TCTTE entries)

The generation of session names is changed for MRO and APPC sessions.

MRO session names

Specifying send and receive prefixes when defining SESSIONS resource definitions for MRO connections is now optional. If you omit the prefix parameters from the command, or leave them blank on the CEDA DEFINE panel, CICS sets a default prefix of a greater-than symbol (>) for send sessions, and a less-than symbol (<) for receive sessions. CICS uses the prefix in conjunction with the send and receive counts to generate the session names.

If you allow the send and receive prefixes to default, CICS creates the last three characters of the session names from the alphanumeric characters A through Z, and 1 through 9. These 3-character identifiers begin with the letters AAA, and

continue in ascending sequence until the number of session entries reaches the limit set by the SENDCOUNT or RECEIVECOUNT value. This method is the same as that for APPC sessions.

To maintain compatibility with earlier releases, this change is optional. You can continue to define your own prefixes for the send and receive sessions, in which case CICS generates the terminal control table terminal entries (TCTTEs) for session names in the same way as for earlier releases.

For LU6.1 SESSIONS definitions, you continue to define send and receive prefixes as before.

Avoiding naming conflicts

To avoid a conflict between session names and terminal names, you are recommended not to use the > or < symbols as the first character in your terminal names. This recommendation applies to defining explicit terminal definitions in the CSD and to selecting terminal names in your terminal autoinstall program.

APPC session names

In earlier releases, CICS creates session names by appending a 3-character alphanumeric string to the - (minus) symbol. Names begin with 999 and continue in descending sequence. This is changed to ascending sequence, beginning with -AAA.

Sharing SESSIONS definitions with earlier releases

MRO SESSIONS definitions with the default prefix cause the generation of duplicate names in earlier CICS releases if you attempt to install more than one SESSIONS definition. The duplicate entries are rejected.

This occurs because CICS now manages multiple definitions using the new method, generating unique session names, but earlier CICS releases use the old method, which causes the duplicate session names. However, in addition to duplicate entries being rejected, interregion communication fails to open, with message DFHIR3780 or DFH3780, depending on the release level of the CICS region.

Because earlier CICS releases cannot handle multiple SESSIONS definitions that have the default prefix, you are recommended not to share SESSIONS definitions between CICS TS Release 1 and earlier releases of CICS.

Changes to the TERMINAL definition

The following changes are made to the TERMINAL definition:

Table 26 (Page 1 of 2). Changes to the TERMINAL definition		
Operand	**Change**	**Description**
ATTACHSEC	Changed	Extended to include persistent sessions support.

Table 26 (Page 2 of 2). Changes to the TERMINAL definition		
Operand	**Change**	**Description**
BINDSECURITY	New	Indicates whether an ESM is being used for bind-time security.
CONSNAME	New	Used to define the name for a VSE console.
DESCRIPTION	New	Use it to provide a description of the resource you are defining.
OPERID, OPERPRIORITY, OPERRSL, and OPERSECURITY	Obsolete	Can be used in compatibility mode only.
REMOTESYSNET	New	Identifies the intercommunication link to the system that owns the terminal.
SECURITYNAME	Does not apply on MRO connections	Can be used for APPC and LU6.1 links only. To specify bind-time and link security for MRO connections, you must define appropriate ESM security profiles.
SPOOLPRTRSL	Changed	SPOOLPRTRSL is obsolete for the report controller only
USEDFLTUSER	New	Indicates either that incoming attach FMH-5 must adhere to the LU6.2 protocols, otherwise the attach request fails, or that CICS is to use the default user's attributes and does not reject the attach.

The new TRANCLASS definition

The TRANCLASS definition allows you to define transaction classes with 8-character names. By putting your transactions into transaction classes, you can control how CICS dispatches tasks. See "DFHTCL—Group for IBM-supplied TRANCLASS definitions" on page 246 for information about the IBM-supplied group of transaction class definitions.

See the *CICS Resource Definition Guide* for information about the TRANCLASS definition.

Changes to the TRANSACTION definition

The following changes have been made to the TRANSACTION definition:

Table 27 (Page 1 of 3). Changes to the TRANSACTION definition		
Operand	**Change**	**Description**
ALIAS	New	Allows you to specify an alias transaction name for a transaction.
DESCRIPTION	New	Allows you to provide a description of the resource you are defining.

Table 27 (Page 2 of 3). Changes to the TRANSACTION definition		
Operand	**Change**	**Description**
CMDSEC	New	Code this if you want command security checking on system programming commands.
CONFDATA	New	Indicates whether CICS is to suppress user data from CICS trace entries when the CONFDATA system initialization parameter specifies HIDETC. See the *CICS System Definition Guide* for more information about the CONFDATA system initialization parameter.
EXTSEC	Obsolete	Can be used in compatibility mode only.
INDOUBT	New	Indicates the action required if the transaction is using intercommunication, and abends at a critical time during syncpoint or abend processing.
PRIMEDSIZE	Obsolete	Can be used in compatibility mode only.
RESSEC	Changed	RESSEC is called RSLC in previous releases of CICS. RSLC(EXTERNAL) can be specified in compatibility mode only.
RESTART	Changed	See "Changes to the RESTART option" on page 101 for more information.
RSL	Obsolete	Can be used in compatibility mode only.
RSLC	Changed	Renamed to RESSEC (see above).
RUNAWAY	New	Specifies the time limit above which a task is assumed to be in runaway condition (looping).
SHUTDOWN	New	Specifies whether the transaction can run during CICS shutdown.
SPURGE	Changed	The SPURGE operand now means "system purgeable", rather than "stall purgeable". It now controls the use of DTIMOUT, EXEC CICS and CEMT SET TASK PURGE, and EXEC CICS and CEMT SET TERMINAL PURGE. See page 61 for more information.
STORAGECLEAR	New	Specifies whether storage is to be cleared when freed.
TASKDATAKEY	New	Specifies the storage key of the storage CICS allocates at task initialization for the duration of the task (task-lifetime storage), and which is accessible by the application. The TASKDATAKEY operand also specifies the key of the storage that CICS obtains on behalf of all programs that run under the transaction.

Table 27 (Page 3 of 3). Changes to the TRANSACTION definition		
Operand	**Change**	**Description**
TASKDATALOC	New	Specifies whether task-lifetime storage acquired by CICS for the duration of the transaction can be located above the 16MB line in virtual storage.
TCLASS	Obsolete	Replaced by the new TRANCLASS operand. TCLASS can be used in compatibility mode only.
TPNAME	New	Gives the name of the transaction that may be used by an APPC partner if the 4-character length limitation of the TRANSACTION operand is too restrictive.
TRANCLASS	New	Specifies the name of the transaction class of which the transaction is a member. See "DFHTCL—Group for IBM-supplied TRANCLASS definitions" on page 246 for more information about transaction classes.
TRANSEC	Obsolete	Can be used in compatibility mode only.
XTPNAME	New	Can be used as an alternative to TPNAME.

Changes to the RESTART option

In earlier releases of CICS, the RESTART option on transaction resource definitions determines whether or not transactions are "restartable". RESTART(YES) means that the transaction restart facility is to be used to restart those tasks that terminate abnormally, and are then backed out by the dynamic transaction backout facility.

The restart option continues to be used for this purpose. It is also used to control whether transactions started by the START command (with a terminal and data specified) are to be restarted if the data is not retrieved.

These two situations are described as follows:

- Failed tasks backed out by dynamic transaction backout. If you specify RESTART(YES), the task that failed is restarted from the beginning of the initial program. (As part of this process, the CICS restart facility invokes the user-replaceable program DFHREST.)

  If dynamic transaction backout fails, or if restart is suppressed dynamically, DFHPEP is invoked in the normal way. The transaction restart facility is especially useful in such situations as a program isolation deadlock, where the task can be restarted automatically rather than resubmitted manually. For background information on dynamic transaction backout, see the *CICS Recovery and Restart Guide*.

  If you specify NO, the restart facility is not required (and DFHREST is not invoked).

- Started tasks with data not retrieved. RESTART(YES) also controls restart processing for a transaction started by a START command that has specified a

terminal, and has passed data using one of the FROM, RTRANSID, RTERMID, or QUEUE options.

If the data is not retrieved before the task terminates, and RESTART(YES) is specified on the transaction definition, the transaction is automatically restarted and is able to retrieve the outstanding data. If the restarted task fails to retrieve the outstanding data, the transaction is restarted again, up to a maximum of five times, after which the data is discarded. For programming information about the START command, see the *CICS Application Programming Reference*.

Changes to the TYPETERM definition

The following changes are made to the TYPETERM definition:

Operand	Change	Description
DESCRIPTION	New	Use it to provide a description of the resource you are defining.
RECOVNOTIFY	New	It applies to the recovery of sessions for terminals in a CICS region running with VTAM persistent sessions.
RECOVOPTION	Extended	Includes support for VTAM persistent sessions.
XRFSIGNOFF	New	Defines the sign-on characteristics of a group of terminals.

Table 28. Changes to the TYPETERM definition

Changes to dual-purpose resource definition

Dual-purpose resource definition is extended to include transaction routing and function shipping.

In addition to the sharing of terminal definitions between systems, CICS extends dual-purpose resource definition to include:

- Transaction definitions
- File definitions

For transaction definitions, dual-purpose resource definition means, for example, that is it possible to share a single transaction definition between a terminal-owning region (TOR) and an application-owning region (AOR). When the definition is installed on the TOR, CICS compares its SYSIDNT name with the REMOTESYSTEM name. If they are different, a remote transaction definition is created. When the definition is installed on the AOR, CICS compares the REMOTESYSTEM name with its SYSIDNT name. If they are the same, a local transaction definition is installed.

Similarly, it is possible to share a FILE definition between an AOR and a data-owning region (DOR), with the correct type of file definition resulting on each region.

With the extensions to dual-purpose resource definition, you may want to review the way in which resources are organized within your resource definition groups.

For example, you may have two groups, one containing all the resources for a CICS TOR and one containing all the resources for a CICS AOR. When using shared resource definitions, you may decide to maintain three groups instead, with the first group containing resources specific to the TOR, the second group containing resources specific to the AOR, and the third group containing resources that are to be installed on both the TOR and the AOR.

Migration planning summary

In summary, all transactions, transactions profiles, programs, map sets, partition sets, VTAM-connected terminals, VSE consoles used as CICS terminals, ISC links and sessions using LU6.1 and APPC (LU6.2) protocols, MRO links, and indirect connections can be installed only from the CSD. The DFHPCT, DFHPPT, and DFHTCT macro tables are obsolete. (For DFHSNT and security considerations, see Chapter 20, "CICS security" on page 167.)

The key points to remember are:

- Define the following resources in the CSD:
    - Transactions and transaction profiles
    - Programs, map sets, and partition sets
    - VTAM-connected terminals and VSE consoles for use as CICS terminals
    - ISC (LU6.1 and APPC) and MRO links
    - Indirect connections

  If these resources are defined in CICS control tables on your existing CICS system, migrate them to the CSD before they can be used by CICS.

- Reassemble all FCTs after first removing the CSD entry.

- Upgrade your CSD by running the DFHCSDUP UPGRADE job.

- Check any of the IBM-supplied definitions in your CSD that you have changed. Check them against the list of changes given later in this chapter.

- Note the change to the SPURGE option in the CEDA DEFINE TRANSACTION definition. It now serves a new purpose in controlling task purging. See "System purging of tasks" on page 61 for more information.

- Check your resource definitions (CSD definitions and any remaining macro definitions) to ensure that all the options you have specified are still supported.

- If you plan to share a CSD between CICS regions at different release levels during parallel running, make a note of the restrictions on release-to-release compatibility of the CSD.

  You can use the DFHCSDUP utility to make offline changes to your CSD, and then either cold start CICS or use the CEDA transaction to install the definitions on your CICS system.

- Consider reviewing the organization of your resources if you plan to use dual-purpose resource definition.

Chapter 14. Macro resource definition

This chapter describes the changes made to CICS resource definition macros. The macros are described alphabetically.

Reassembling tables and migrating VSAM definitions to the CSD

You must reassemble all CICS control tables using CICS TS Release 1 macros, including those control tables where there are no changes to the macro externals.

Check the information about changes to control table externals described in this chapter, and then modify your tables as necessary before reassembling all control tables.

Source compatibility of resource definition macros is not guaranteed from release to release. Review your resource definition table macros and make any necessary changes before reassembling them.

The application load table (DFHALT) macro

The application load table macro (DFHALT) is no longer supported. A new CICS program loading method makes it obsolete. The DFHALT SHR=YES operand is the only DFHALT keyword to have an RDO equivalent. SHR=YES becomes the USESVACOPY attribute on the PROGRAM, MAPSET, and PARTITIONSET resource definitions.

The destination control table (DFHDCT) macros

The following changes are made to the DFHDCT table macro. The highlighted numbers refer to notes at the end of the table.

Table 29 (Page 1 of 2). Changes to the DFHDCT macros		
DFHDCT macro	**Operand**	**Change**
DFHDCT TYPE=INITIAL	• SEPASMB **1** • TRNSUFX **1**	Obsolete
DFHDCT TYPE=EXTRA	• RSL • RESIDNT **1**	Obsolete
DFHDCT TYPE=INTRA	• RSL • REUSE **2**	Obsolete
DFHDCT TYPE=REMOTE	RSL	Obsolete
DFHDCT TYPE=INITIAL	USERID specifies the user ID to be used for security checking in transactions started by transient data trigger levels.	New
DFHDCT TYPE=EXTRA	LENGTH specifies the record length in bytes of fixed-length records in the queue.	New
DFHDCT TYPE=EXTRA	RMTNAME specifies the name by which the queue is known in a remote system.	New

Table 29 (Page 2 of 2). Changes to the DFHDCT macros		
DFHDCT macro	**Operand**	**Change**
DFHDCT TYPE=EXTRA	SYSIDNT specifies the system name of the CICS region that owns the transient data queue.	
DFHDCT TYPE=INTRA	LENGTH specifies the record length in bytes of fixed-length records in the queue.	New
DFHDCT TYPE=INTRA	USERID specifies the user ID you want CICS to use for security checking for the trigger-level transaction specified on the TRANSID operand.	New

Note:

1 **Nonresident transient data destinations**

Transient data destinations, defined in the DCT using the DFHDCT macro, can now be specified only as resident extrapartition, intrapartition, indirect, or remote. Support for **nonresident** extrapartition transient data destinations (that is, for destinations using nonresident data set control blocks) is withdrawn.

2 **Reusable control intervals for intrapartition destinations**

You cannot specify whether or not the VSAM control intervals for intrapartition transient data destinations are reusable. They are always reusable by default, making the REUSE operand on the DFHDCT TYPE=INTRA macro obsolete.

Changes to CICS transient data queues

The following changes are made to CICS transient data queues.

Table 30 (Page 1 of 2). Changes to the transient data queues		
Queue name	**Description**	**Change**
CAIL	Log of autoinstall terminal model manager messages.	New
CCPI	Log of messages related to CPI-C.	New
CCSE and CCSO	These queues are obsolete because CICS does not support C/370.	Obsolete
CDUL	Log of transaction dump messages.	New
CMIG	Log of migration-related error messages.	New
CPLD and CPLI	These queues are obsolete because CICS does not support DOS PL/I.	Obsolete
CRDI	Log of all individually installed resource definitions for program, mapset, partitionset, transaction, profile, file, LSR pool, and partner resource types.	New
CSFL	Log for file control messages.	New
CSKL	Log for transaction manager messages, and for transaction and profile definitions installed in the active CICS system.	New
CSNE	Log of messages produced by DFHZNAC.	New
CSPL	Log for program manager messages.	New
CSRL	Log of partner resource manager messages.	New

Table 30 (Page 2 of 2). Changes to the transient data queues		
Queue name	**Description**	**Change**
CSSN and CSSM	These queues are obsolete because statistics are written to Data Management Facility (DMF) data sets. See Chapter 28, "Statistics" on page 223 for more information For information about DMF, see the *CICS Operations and Utilities Guide*.	Obsolete
CSZL	Log of FEPI-related messages.	New
CSZX	Log of unexpected FEPI events.	New
CXRF	All CICS systems (non-XRF CICS regions, and both active and alternate regions in an XRF environment) use CXRF if there is a need to write to transient data destinations during CICS startup, before transient data initialization has completed. See "The DFHCXRF transient data extrapartition data set" on page 81 for more information.	Changed

DFHDCT2$ sample table

Examples of the entries you need for all the new CICS destinations are supplied in the sample table, DFHDCT2$. For more information about the new queues, see the *CICS Resource Definition Guide*.

The file control table (DFHFCT) macros

Table 31 summarizes the changes made to the DFHFCT macros.

Table 31 (Page 1 of 2). Changes to the DFHFCT macros		
DFHFCT macro	**Operand**	**Change**
DFHFCT TYPE=FILE	• RSL • SERVREQ=REUSE **1**	Obsolete
Note: **1** The DFHCSDUP MIGRATE function issues a warning message stating that the SERVREQ parameter is ignored, but the file entries that specify SERVREQ=REUSE are migrated successfully.		
DFHFCT TYPE=FILE	The DSNAME operand specifies the 1-44 character name of the JCL data set name (DSNAME) to be used for this file.	New
DFHFCT TYPE=FILE	You can now specify the number of tracks or blocks to be searched for keyed records on the SRCHM operand. The default is 0.	Changed
DFHFCT TYPE=GROUP	The GROUP macro names the groups into which FCT definitions will be put when you migrate to RDO.	New macro
DFHFCT TYPE=INITIAL	The MIGRATE operand controls the building of FCT entries for VSAM files eligible for RDO.	New

Table 31 (Page 2 of 2). Changes to the DFHFCT macros		
DFHFCT macro	**Operand**	**Change**
DFHFCT TYPE=REMOTE	RSL	Obsolete

The journal control table (DFHJCT) macros

Table 32 summarizes the changes made to the journal control table macro.

Table 32. Changes to the DFHJCT macros		
DFHJCT macro	**Operand**	**Change**
DFHJCT TYPE=ENTRY	• BUFSUV • RSL	Obsolete
DFHJCT TYPE=ENTRY	The ARCHJCL operand specifies the VSE sublibrary name of the member to be used for this journal when submitting an archive job.	New
DFHJCT TYPE=ENTRY	AUTOARCH is a new keyword on the JOUROPT operand. AUTOARCH invokes automatic journal archiving. You cannot code PAUSE if you code AUTOARCH.	Changed

The monitoring control table (DFHMCT) macros

Table 33 summarizes the changes to CICS monitoring control table macros. See the *CICS Release Guide* for a summary of other monitoring facility changes.

Table 33 (Page 1 of 2). Changes to the DFHMCT macros		
DFHMCT macro	**Operand**	**Change**
DFHMCT TYPE=EMP **1**	The ACCOUNT keyword on the CLASS operand	Obsolete
DFHMCT TYPE=RECORD **2**	• The ACCOUNT and EXCEPTION keywords on the CLASS operand • CPU • CONV **3** • DATASET • EXIT • FREQ • MAXBUF	Obsolete

Table 33 (Page 2 of 2). Changes to the DFHMCT macros		
DFHMCT macro	**Operand**	**Change**
DFHMCT TYPE=EMP	PERFORM(MOVE(*n3*,*n4*)) **4**	Changed

Note: **1** The DFHMCT TYPE=EMP macro is source-compatible with CICS for VSE/ESA Version 2.3. However, it is not object-compatible. Reassemble programs using this macro to ensure they continue to work correctly.

2 You should only need to use the DFHMCT TYPE=RECORD macro when you want to use performance class data fields selectively. You do not need to use it for the transaction monitoring exception or accounting classes.

3 If your existing MCT specifies CONV=YES, remove this and specify MNCONV as a system initialization parameter. Alternatively you can set the MNCONV option dynamically using the CEMT SET MONITOR or EXEC CICS SET MONITOR commands.

4 The range for *n3* is changed from 0 through 255 to 0 through 8191. The range for *n4* is changed from 1 through 256 to 1 through 8192. The maximum length of the user character field is (*n3* + *n4*), and must be in the range 1 through 8192.

The nucleus load table (DFHNLT) macros

The DFHNLT macro is no longer supported because a new CICS program loading method makes it obsolete. There is no equivalent RDO support for DFHNLT parameters.

The program control table (DFHPCT) macros

The PCT is obsolete at runtime, but DFHPCT macros continue to be shipped for migrating tables to the CSD. To migrate the tables to the CSD, specify the MIGRATE option and reassemble them against the latest macros. Most DFHPCT macros have CSD equivalents. The obsolete parameters are shown in Table 34.

Table 34. DFHPCT macro operands without equivalents in the CSD	
Operand	**Notes**
DTB	CICS assumes DTB for all transactions. Specify a dynamic transaction backout program using the DBP SIT parameter. You cannot specify DBP=NO.
FDUMP	Control of ASRA and ASRB dumps is provided by entries in the dump table that you create by EXEC CICS SET and CEMT SET commands, so that your settings can be dynamically modified on a running CICS system. See "The CICS dump table" on page 201 for information about the dump table.
PRMSIZE (**and** CSD PRIMEDSIZE keyword)	Primed storage is obsolete because of the way in which the CICS storage manager works.
ANTICPG	Anticipatory paging is obsolete.

The program list table (DFHPLT) macros

Table 35 summarizes the changes made to the DFHPLT macros.

Table 35. Changes to the DFHPLT macros		
DFHPLT macro	**Operand**	**Notes**
DFHPLT TYPE=ENTRY	PROGRAM= progname	Each program must have a definition in the CSD or must be capable of being autoinstalled. Undefined programs before the DFHDELIM statement are system autoinstalled.
DFHPLT TYPE=ENTRY	PROGRAM= DFHDELIM	New. Program entries: • Before the PROGRAM=DFHDELIM entry in a PLTPI are executed during the second stage of initialization (first phase PLTPI processing). • After the PROGRAM=DFHDELIM entry in a PLTPI are executed during the third stage of initialization (second phase PLTPI processing). • Before the PROGRAM=DFHDELIM entry in a PLTSD are executed during the first quiesce stage of shutdown (first phase PLTSD processing). • After the PROGRAM=DFHDELIM entry in a PLTSD are executed during the second quiesce stage of shutdown (second phase PLTSD processing). See the *CICS Resource Definition Guide* for more information.

First phase PLTPI and second stage PLTSD programs do not need program resource definitions. If they are not defined they are system autoinstalled (irrespective of the program autoinstall system initialization parameters specified).

Second phase PLTPI and first phase PLTSD programs can be defined using program autoinstall depending on the program autoinstall system initialization parameters specified. If program autoinstall is not in use, PLT processing requires program resource definitions in the CSD.

See the *CICS Resource Definition Guide* for more information about autoinstall for programs, map sets and, partition sets.

The processing program table (DFHPPT) macros

The PPT is obsolete at runtime, but DFHPPT macros continue to be shipped for migrating tables to the CSD. To migrate the tables to the CSD, specify the MIGRATE option and reassemble them against the latest macros. If you migrate large tables in a single group, you could subsequently experience problems managing them with CEDA. To avoid possible problems, divide large tables into a number of groups.

Most DFHPPT macros have CSD equivalents. The obsolete parameters are shown in Table 36 on page 111.

Table 36. DFHPPT macro operands without RDO equivalents

DFHPPT macro	Operand	Change
DFHPPT TYPE=GROUP	FN replaced by CICS-supplied DFH*xxx* groups.	Changed.
DFHPPT TYPE=INITIAL	LENABLE	Obsolete.
DFHPPT TYPE=INITIAL	RES=PGOUT, RES=FIX, and RES=ALIGN	These operands do not have RDO equivalents in the CSD because they are no longer relevant to CICS program management.
DFHPPT TYPE=ENTRY	RSL	Obsolete.

The signon table (DFHSNT) macros

The DFHSNT signon table macros are obsolete. See Part 6, "Security" on page 165 for more information about the changes made to security.

The system recovery table (DFHSRT) macros

Table 37 summarizes the changes made to the system recovery table.

Table 37. Changes to the DFHSRT macros

DFHSRT macro	Operand	Change
DFHSRT TYPE=SYSTEM	• PROGRAM • ROUTINE	Obsolete
DFHSRT TYPE=SYSTEM	• RECOVER=YES adds specified OS/390 abend codes and VSE/ESA cancel codes to the SRT • RECOVER=NO removes specified abend codes from the SRT	New
DFHSRT TYPE=SYSTEM	Changed to DFHSRT TYPE=SYSTEM|USER. The abend code is a user abend code (including CICS abend codes) and corresponds to a VSE U*nnnn* abend code	Changed

The terminal control table (DFHTCT) macros

The use of the DFHTCT control table is restricted to:

• Remote BTAM terminals for use with MRO or ISC
• Sequential devices
• VTAM logical device codes (LDCs).

Definitions for VTAM-connected terminals, VSE consoles for use as CICS terminals, multi-region operation (MRO), intersystem communication (ISC) links, sessions using LU6.1 and LU6.2 protocols, and indirect connections are all defined by resource definitions in the CSD.

These terminal control resource definition changes mean that you cannot initialize CICS with a TCT that contains CSD-supported definitions. Migrate the CSD-supported definitions to your CSD, and then reassemble the TCT with the source instructions for the migrated terminals removed, or reassemble the table with the MIGRATE=COMPLETE operand specified on the DFHTCT TYPE=INITIAL macro.

If you use a TCT to define non-VTAM terminals (in addition to your VTAM terminal definitions in the CSD) also specify VTAM on the ACCMETH parameter on the DFHTCT TYPE=INITIAL macro (that is, specify both VTAM and NONVTAM).

All TCT macros associated with defining BTAM devices (except where they are being defined as remote) are obsolete.

The terminal list table (DFHTLT) macros

There are no changes to the TLT macros.

The temporary storage table (DFHTST) macros

The RSL operand is removed from the DFHTST TYPE=SECURITY macro.

The transaction list table (DFHXLT) macros

There are no changes to the XLT macros.

Migration planning summary

In summary, there are significant of changes made to macro-level resource definition. The key point to remember is:

- Reassemble all CICS control tables using the VSE/ESA Version 2 Release 4 sublibrary PRD1.BASE, including those tables that have not changed.

Part 5. Programming

Table 38. Programming road map

If you want to...	Refer to...
Know more about DFHMSCAN	"DFHMSCAN" on page 118
Know more about the CICS Application Migration Aid (CICS/AMA)	"The CICS Application Migration Aid" on page 118
Know about the new, changed, and obsolete EXEC CICS commands	Chapter 16, "The application programming interface (API)" on page 121
Know more about the macro API and its command-level equivalents	Appendix C, "The macro API and its command-level equivalent" on page 249
Know about the changes you have to make to user-replaceable programs and user exits	Chapter 18, "User exits and user-replaceable programs" on page 141
Know about the changes made to control block access and usage	"Changes to control block access and usage" on page 121
Know what to do about programs using EXEC DLI commands or the CALL DL/I interface	"EXEC DLI commands and the CALL DL/I interface" on page 123
Know about the changes made to system programs	"Changes to CICS system programs" on page 138
Know about the new, changed, and obsolete system programming commands	Chapter 17, "The system programming interface (SPI)" on page 131
See the changes made to global user exit points	"Summary of global user exit points" on page 142
Know about the new exit programming interface (XPI)	"The exit programming interface (XPI)" on page 148
Know about the changes to the task-related user exit interface	"Task-related user exits" on page 150
Know about the changes made to CICS-supplied transactions	Chapter 19, "CICS-supplied transactions" on page 155

Chapter 15. Programming considerations

The general-usage programming interface for CICS, as documented in the *CICS Application Programming Reference* and the *CICS System Programming Reference*, continues to provide upward compatibility for command-level programs. To gain the benefits of upward compatibility and to protect your investment in software development, avoid using any undocumented interfaces.

Command-level programming interfaces

CICS supports two command-level programming interfaces:

- The application programming interface (API)
- The system programming interface (SPI)

The application programming interface (API)

CICS continues to extend the CICS application programming interface (API), a process started in CICS for VSE/ESA Version 2.3. It includes functions that were previously only available using the macro-level programming interface or by direct access to CICS control blocks. For detailed information about changes made to the API, see Chapter 16, "The application programming interface (API)" on page 121.

The system programming interface (SPI)

The system programming commands are now recognized as a separate programming interface. Consequently a number of changes are made, all of which are described in Chapter 17, "The system programming interface (SPI)" on page 131.

Program compatibility

CICS provides upward compatibility at source and object level for command-level programs written in assembler language, COBOL, and program compiled with a Language Environment-conforming compiler, that executed correctly under CICS/VSE Version 2, subject to the constraints outlined in Table 39.

Language	Restriction
Table 39 (Page 1 of 2). Programming language restrictions	
Language	**Restriction**
For all languages	The function must still be supported.
	Macro-level application programs are not supported.
	Execution of obsolete commands causes the program to terminate abnormally.
	Source compatibility with other members of the CICS family is maintained, subject to the defined common subset of the CICS API.
Assembler language	CICS command API programs only are supported.
C	C application programs compiled with the C/370 compiler are not supported. Recompile C/370 programs using the IBM C for VSE/ESA compiler.

Table 39 (Page 2 of 2). Programming language restrictions	
Language	**Restriction**
COBOL	COBOL application programs compiled by the DOS/VS COBOL and VS COBOL II compilers are supported by CICS, but to ensure service support, you are recommended to relink these using the LE library, PRD2.SCEEBASE.
PL/I	DOS PL/I programs are not supported. Recompile DOS PL/I command-level programs using the IBM PL/I for VSE/ESA compiler.
LE/VSE	Programs written and compiled using LE-conforming compilers that are currently available for COBOL, PL/I, and C, are both source and object compatible, providing they do not use obsolete commands.
RPG	RPG application programs are not supported.

A degree of object compatibility is provided by application programs compiled using the LE-conforming compilers and either the CICS TS Release 1 libraries or the CICS for MVS/ESA libraries. However, there are instances where retranslation and recompilation are necessary for particular commands. For example, the EXEC CICS WRITE OPERATOR command is not object compatible between the different platforms. In these cases, you must retranslate and recompile the application programs when moving them between operating system platforms. See Table 40 for a list of the commands and options that require retranslation.

Table 40. Commands translated using CICS for MVS/ESA translator that require retranslation	
EXEC CICS Command	**Options**
ASSIGN	PROGRAM, NATLANGINUSE, NEXTTRANSID, TERMPRIORITY, TRANPRIORITY, and USERPRIORITY.
WRITE OPERATOR	ACTION, MAXLENGTH, REPLY, REPLYLENGTH, ROUTECODES, NUMROUTES, and TIMEOUT
INQUIRE PROGRAM	ENTRYPOINT, EXECUTIONSET, LOADPOINT, REMOTENAME, REMOTESYSTEM, SHARESTATUS, and TRANID
SET PROGRAM	EXECUTIONSET
INQUIRE SYSTEM	DTRPROGRAM and ECSCS
SET SYSTEM	DTRPROGRAM and ECSCS

Compilation considerations

CICS for VSE/ESA Version 2.3 command-level applications compiled or assembled with the following compilers and assemblers do not need to be retranslated, recompiled, or reassembled.

Table 41. Compiler combinations supported by CICS TS Release 1				
Compiler name	Release	CICS/VSE 2.1	CICS/VSE 2.2	CICS for VSE/ESA Version 2.3
IBM C for VSE/ESA	1.1			X
DOS/VS COBOL **1**	1.3.1	X	X	X
VS COBOL II **1**	1.3.2 1.4.0	X	X X	X X
IBM COBOL for VSE/ESA	1.1.0			X
IBM PL/I for VSE/ESA	1.1.0			X
Note: **1** CICS command-level application programs compiled using the VS COBOL II and DOS/VS COBOL compilers run under the LE runtime libraries in compatibility mode. For full support (including Year 2000 support) relink-edit COBOL programs using the LE library PRD2.SCEEBASE.				

All CICS modules supplied with the VSE/ESA 2.4 system package are assembled with the High-Level Assembler.

For information about VSE residence and addressing modes, and about CICS application programs that can be loaded in the SVA, see the *CICS System Definition Guide*.

Macro-level application programs

Support for the macro-level programming interface is withdrawn. CICS programming enhancements are made only to the API commands.

New application programs can be written using only the CICS API and SPI, conforming to the general-usage application programming interfaces described in the *CICS Application Programming Reference* and the *CICS System Programming Reference* manuals.

Decide if your existing macro applications have a future, and evaluate the benefits of retaining, converting, testing, and maintaining individual applications and suites of applications against the cost of converting them to command-level.

If you cannot convert (or rewrite) macro-level programs immediately, you can continue to use them on CICS for VSE/ESA Version 2.3 regions, coexisting with CICS TS Release 1, for the remaining lifetime of the programs.

Ideally, aim to convert (or replace) your macro-level programs within as short a space of time as possible, and not plan to retain these programs indefinitely.

The macros affected are those documented in the following manuals:

- The *CICS/VS Application Programming Reference Manual (Macro Level)* for CICS/VS 1.7
- The *CICS/DOS/VS 1.7 Customization Guide*
- The *CICS/VSE Customization Guides* for CICS/VSE Version 2.

If CICS detects a macro-level program, it terminates the program abnormally with abend code ASRD.

Conversion tools

CICS provides tools to help you convert macro-level programs to command level.

DFHMSCAN

DFHMSCAN is a batch facility that scans the modules in a CICS phase sublibrary, looking for for macro calls and instances of EXEC CICS ADDRESS CSA commands. It lists any macro calls and references to EXEC CICS ADDRESS CSA that it finds in a report with appropriate warning messages. You use this report to help determine how much effort will be involved in converting macro-level programs to command-level.

The CICS Application Migration Aid

The CICS Application Migration Aid simplifies the process of converting macro-level programs to command-level.

The migration aid is a batch program that reads macro-level assembler language, COBOL, and PL/I source code. It converts simple macro calls automatically, replacing them with their command-level equivalent (if such an equivalent exists).

CICS Application Migration Aid partially converts complex macro calls. When it has converted a complex call as far as possible, it issues messages prompting you to supply missing data so that it can complete the conversion process. For example, the line of code:

```
DFHTD TYPE=PUT,DESTID=CSML,TDADDR=TDOAVRL
```

is partially converted to:

```
EXEC CICS WRITEQ TD QUEUE ('CSML') FROM (????) LENGTH (????)
```

Messages ECRCM0P03 and ECRCM0P04 are issued requesting information:

```
* ECRCM0P03 08 - FROM () OPTION REQUIRED
* ECRCM0P04 08 - LENGTH () VALUE REQUIRED
```

CICS Application Migration Aid can convert only those macros documented in the *CICS/VS Application Programmer's Reference Manual (Macro Level)*.

The conversion process is summarized in Figure 11 on page 119.

```
                 Macro-level source program

                           │
                           │
                           ▼
             ┌─────────────────────────────────┐
             │                                 │
             │     1.  Run the migration aid   │
             │                                 │
             └─────────────────────────────────┘
                │                          │
 (Simple macros │                          │
  converted by the                  Messages prompt and aid
  migration aid) │                   the manual conversion of
                │                    more complex macros
                │                          │
                │                          ▼
                │              ┌──────────────────────────┐
                │              │                          │
                │              │   2.  Complete conversion│
                │              │   of more complex macros │
                │              │                          │
                │              └──────────────────────────┘
                │                          │
                ▼                          ▼
        Untested command-level source program

                           │
                           ▼
             ┌─────────────────────────────────┐
             │                                 │
             │     3.  Test command-level      │
             │         source program          │
             │                                 │
             └─────────────────────────────────┘
                           │
                           │
                           ▼
         Tested command-level source program
```
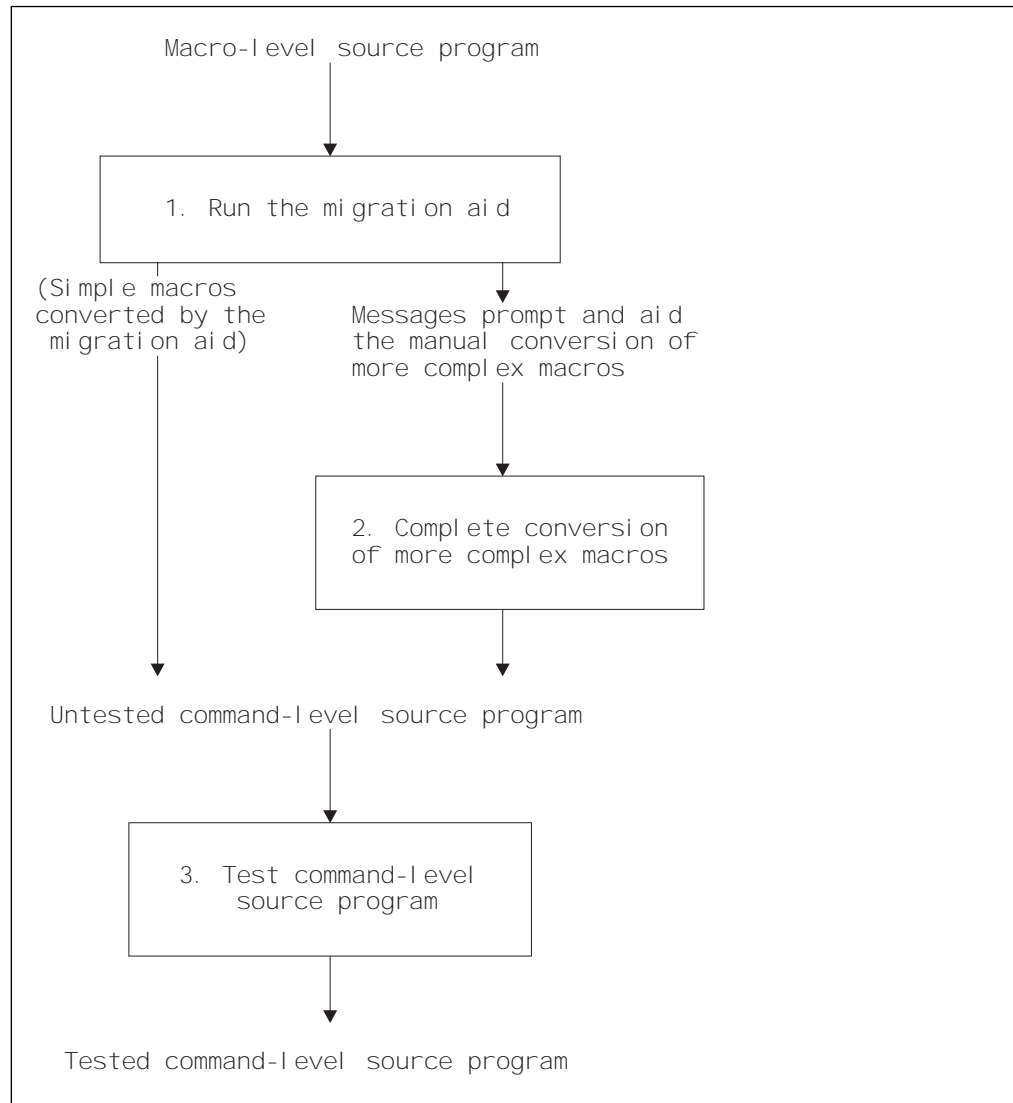
Figure 11. The three stages in the CICS Application Migration Aid conversion process

CICS/AMA does **not** convert RPG macro-level programs.

Migration planning summary

In summary, review your CICS application and system programs, and any
CICS-related programs that process CICS output, to make sure that they are
supported. You may have to modify or redesign any programs that do not conform
to supported programming interfaces.

The key points to remember are:

- Changes introduced by the removal of support for the macro-level programming
  interface.

- New, changed, and obsolete options on EXEC CICS commands.

- The changes made to CICS system programs.

If programs obtained from software vendors do not run correctly after migration,
order and install new or modified versions, or purchase replacement products.

All programs, whether changed or not, must be fully tested before being introduced into your production system. Where possible, such testing should also be done on your existing CICS for VSE/ESA Version 2.3 system.

Chapter 16. The application programming interface (API)

CICS provides upward compatibility, at source and object level, for all CICS application programs that are written to the application programming interface in a supported language, and which executed correctly under CICS for VSE/ESA Version 2.3.

BMS map sets and partition sets

Map DSECTs and objects are upwardly compatible from CICS for VSE/ESA Version 2.3.

The EIBCPOSN field for testing the cursor location is still supported, but you are recommended to use the new CURSLOC attribute in your DFHMSD map definitions. The CURSLOC attribute allows you to test the cursor position using the DFHBMCUR and DFHBMEC values defined in the DFHBMSCA copy member. See the *CICS Application Programming Guide* for information about how to use the CURSLOC attribute. CICS supplies a new suite of CUA text-level application programs. These programs use the new CURSLOC method for testing cursor positions in maps received from the terminal.

Changes to control block access and usage

Many of the CICS control blocks are changed significantly. Some are removed entirely as part of the restructuring of CICS code, while others are no longer accessible because they are provided in object form only. Application programs must not:

- Contain EXEC CICS ADDRESS CSA statements
- Attempt to invoke CICS internal macros
- Attempt to access CICS internal control blocks

The use of uncommitted fields, unauthorized use of committed fields, and attempts to access and use the contents of uncommitted control block fields can have unpredictable results, and must be avoided.

EXEC CICS ADDRESS CSA

The EXEC CICS ADDRESS CSA command interface is withdrawn.

If you run an application that issues an ADDRESS CSA command, CICS returns the address of a fetch-protected copy of the CSA and your application is terminated abnormally with an abend code of ASRD as soon as it attempts to address the fetch-protected storage. In addition to issuing the ASRD abend code, CICS writes message DFHAP0501 to the new transient data queue, CMIG, which acts as a migration log.

```
DFHAP0501 'applid' PROGRAM 'progname' HAS ISSUED AN ADDRESS CSA COMMAND
THAT IS NO LONGER SUPPORTED
```

In all cases, your program is terminated.

If you attempt to re-translate an application that contains an EXEC CICS ADDRESS CSA command, the translator issues message DFH7261.

The addresses of the CSA and TCA are no longer passed to global- or task-related user exits.

You can use the macro scan utility program, DFHMSCAN, to check for the presence of EXEC CICS ADDRESS CSA commands in load modules. See "DFHMSCAN" on page 118 for a brief description of DFHMSCAN. More detailed information is given in the *CICS Operations and Utilities Guide*.

Macro invocations and references to CICS internal control blocks

If you have an application program that attempts to invoke a CICS macro or attempts to access internal control blocks, CICS:

- Issues a warning message
- Names the offending program or transaction
- Abends the program or transaction
- Disables the program or transaction

If a global user exit issues an unauthorized request, your CICS region abends.

All applications that use commands documented in the *CICS/VSE Application Programming Reference* manual are source and object compatible, provided that the function is still supported. Execution of obsolete commands can cause the application to terminate abnormally.

Note that the preceding paragraph is a statement of upward-compatibility only. There is no guarantee that every program translated or link-edited with the CICS TS Release 1 link-edit stub can run on earlier versions of CICS.

DFHEICAL macro

In previous versions of CICS, the translator generated a DFHEICAL macro for EXEC CICS assembler rather than the DFHECALL macro. The DFHEICAL macro continued to be shipped so that pre-translated program segments could continue to be used without retranslation. However, the DFHEICAL macro is no longer supported. Any program segments that need to be assembled also need to be retranslated. The object code generated is unchanged.

DFHEIMX global macro, discontinued

The withdrawal of all support for macro-level programs means that the CICS global &DFHEIMX is no longer supported. When you convert mixed command- and macro-level programs to the command-level API, make sure that you remove the &DFHEIMX global, in addition to replacing the macros with command API statements. If you don't do this the assembly step fails with MNOTE 16. If you convert your mixed command-and-macro programs on CICS for VSE/ESA Version 2.3 in readiness for migration, assembly will not fail with the MNOTE error, in which case ensure that you remove the global. If you attempt to run a program generated with the &DFHEIMX global, it terminates abnormally with an ASRD abend code.

The EXEC CICS ADDRESS ACEE command

3
3
With the withdrawal of the macro-level programming interface and the user-replaceable security programs DFHXSE and DFHXSP, you can no longer access control blocks containing information about signed-on users. The extension of the ADDRESS command to return the address of the access control environment element (ACEE) enables an application to obtain security-related information

available on earlier releases through methods that are now obsolete. See the *CICS Application Programming Reference* manual for information about the ADDRESS ACEE function.

EXEC DLI commands and the CALL DL/I interface

EXEC DLI commands and their options work unchanged. However, the CALLDLI interface is changed because access to the TCA is no longer available. In all cases, applications using the TCA to check status must be modified to use the UIB. Further information about this change and its possible effects are described in the publications for DL/I.

If you have customized your CICS system in the area of the CICS-DL/I interface (for example, for the initialization or termination of DL/I recovery with the global user exit XRCINIT), examine your exit programs and modify them to conform to linkage conventions. You also need to ensure that your exit programs can run in a 31-bit addressing environment.

Write-to-operator command

If you are using unsupported methods for the write-to-operator function (such as the PL/I DISPLAY statement) you must modify your programs to use supported methods only. For example, you must replace a PL/I DISPLAY statement with an EXEC CICS WRITE OPERATOR command. You are recommended to apply this change for CICS for VSE/ESA Version 2.3 also.

Changes to existing commands and parameters

There are changes to the way in which CICS processes some commands. These processing changes affect:

- COMMAREA processing
- Clearing the next transaction identifier
- Clearing the EIBAID field between terminal sessions

New parameters do not affect the migration of your existing application programs.

See the *CICS Application Programming Guide* for detailed information about COMMAREA and EIBAID.

COMMAREA processing

- The address of a COMMAREA passed to an application program can be above 16MB, below 16MB, or it can be a zero address.
- If CICS is running with storage protection, a COMMAREA can be in CICS-key storage or USER-key storage.
- A COMMAREA can also be in read-only storage; possibly obtained using a VSE GETVIS call.
- The length of the COMMAREA can be a positive value or zero. However, a negative value always results in an error.

- If necessary, CICS copies the COMMAREA to ensure it is accessible to a application program. The tables shown in this section deal with these various COMMAREA states.

The following sections describe the result of a program passing a COMMAREA from one program to another via an EXEC CICS LINK, XCTL, or RETURN TRANSID.

Length error cases
Errors associated with invalid lengths are shown in Table 42.

Table 42. Causes of length errors			
Address	**Length**	**RESP value**	**RESP2 value**
Zero	Non-zero	LENGERR	26
Non-zero	Negative	LENGERR	11

COMMAREA processing for a LINK command

Table 43. COMMAREA processing for a LINK command					
COMMAREA attributes			**Called program attributes**		**COMMAREA**
Storage key	**Address**	**Length**	**Execution key**	**Data location**	
–	Zero	Zero	CICS	ANY or BELOW	X'FF000000' address
Any	Any	Zero	CICS	ANY	Not copied[1]
Any	<16MB	Zero	CICS	BELOW	Not copied[1]
USER	Any	Zero	USER	ANY	Not copied[1]
USER	<16MB	Zero	USER	BELOW	Not copied[1]
Any	>16MB	Zero	Any	BELOW	Copied[2]
Non-USER	Any	Zero	USER	ANY	Copied[2]
Non-USER	<16MB	Zero	USER	BELOW	Copied[2]
Any	Any	>0	CICS	ANY	Not copied[3]
Any	<16MB	>0	CICS	BELOW	Not copied[3]
USER	Any	>0	USER	ANY	Not copied[3]
USER	<16MB	>0	USER	BELOW	Not copied[3]
Any	>16MB	>0	Any	BELOW	Copied[4]
Non-USER	Any	>0	USER	ANY	Copied[4]
Non-USER	<16MB	≥0	USER	BELOW	Copied[4]

Notes:

[1] There is no need for the COMMAREA to be copied because the receiving program can handle both the storage key and the address, and CICS passes the same address it is given. Even though the length is defined as zero, CICS does not return an error condition, assuming that the receiving

program knows the correct length. This is not recommended: you should always specify the length of a COMMAREA.

² CICS creates a copy of the COMMAREA with a zero-length, and passes the address and zero length to the application program. In these cases, the COMMAREA is not valid and must not be used. Unpredictable results can occur if the receiving program uses the storage referenced by the passed address. This is because the storage is not in the correct key or not in the correct addressing mode.

³ The address and length are valid, and the COMMAREAs do not need to be copied because the receiving program can handle both the storage key and the address.

⁴ CICS copies the COMMAREA below the line in user-key storage to ensure that it is accessible to the receiving program.

COMMAREA processing for an XCTL command
The following table summarizes COMMAREA processing for an XCTL command

Table 44. COMMAREA processing in an XCTL command					
COMMAREA attributes			**Called program attributes**		**COMMAREA**
Storage key	**Address**	**Length**	**Execution key**	**Data location**	
–	Zero	Zero	Any	ANY or BELOW	X'FF000000' address
Any	Any	Zero	CICS	ANY	Not copied¹
Any	<16MB	Zero	CICS	BELOW	Not copied¹
USER	Any	Zero	USER	ANY	Not copied¹
USER	<16MB	Zero	USER	BELOW	Not copied¹
Any	>16MB	Zero	Any	BELOW	Not copied²
Non-USER	Any	Zero	USER	ANY	Not copied²
Non-USER	<16MB	Zero	USER	BELOW	Not copied²
Any	Any	>0	CICS	ANY	Not copied³
Any	<16MB	>0	CICS	BELOW	Not copied³
USER	Any	>0	USER	ANY	Not copied³
USER	<16MB	>0	USER	BELOW	Not copied³
Any	>16MB	>0	Any	BELOW	Copied³
Non-USER	Any	>0	USER	ANY	Copied³
Non-USER	<16MB	>0	USER	BELOW	Copied³

Notes:

¹ There is no need for the COMMAREA to be copied because the receiving program can handle both the storage key and the address, and CICS passes the same address it is given. Even though the length is defined as zero, CICS does not return an error condition, assuming that the receiving

program knows the correct length. This is not recommended: you should always specify the length of a COMMAREA.

² Either because of its execution key or its data location attribute, the receiving program is unable to handle the address passed. Nevertheless, CICS passes the address it is given. This can lead to unpredictable results if the receiving program uses the storage referenced by the passed address in these situations. This is because the storage is not in the correct storage key, or not in the correct addressing mode.

³ The COMMAREA address and length are valid, in both the copied and the not-copied case. CICS only copies the COMMAREA if it is necessary to ensure that it is accessible to the receiving program. CICS always copies a COMMAREA below 16MB in USER key.

COMMAREA processing for a RETURN command with TRANSID

Table 45. COMMAREA processing in CICS TS Release 1 for a RETURN command

COMMAREA attributes			Called program attributes		COMMAREA
Storage key	Address	Length	Execution key	Data location	
Any	Any	Zero	Any	ANY or BELOW	X'FF000000' address
Any	Any	>0	Any	ANY or BELOW	Copied

Note: When CICS copies a COMMAREA for the next transaction on a RETURN command, it copies it in the appropriate EXECKEY and DATALOCATION for the initial program of the new transaction.

Clearing the next transaction identifier

The next transaction identifier is cleared in the following circumstances:

- For COMMAREA errors on the final return to CICS
- For INPUTMSG errors on the final return to CICS
- On abnormal termination of the transaction

EIBAID field cleared between terminal sessions

EIBAID holds the attention identifier (AID) which indicates the method used by the terminal operator to transmit data from the device to CICS; for example, the ENTER key, a program function key, and so on. This field can be tested after each terminal control (or BMS) input operation to determine further processing.

In earlier releases of CICS, it is possible for the EIBAID field to contain values left from a previous task run at the same terminal. The field content remains unaltered until updated by a new input operation, or until it is cleared only at the end of the terminal session.

The EIBAID cannot contain unpredictable data because it is cleared at the end of the transaction. Therefore, if an AID exists, there is a value in this field to represent this AID; if an AID does not exist, the value of EIBAID is zero.

New EXEC CICS commands

Table 46. New EXEC CICS commands

EXEC CICS command	Use this command to ...
CHANGE PASSWORD	Change the password recorded by an ESM for a specified user ID.
EXTRACT ATTRIBUTES (APPC)	Extract conversation state information for APPC mapped conversations.
EXTRACT ATTRIBUTES (MRO)	Extract conversation state information for MRO conversations.
GDS EXTRACT ATTRIBUTES	Access state information about an APPC basic conversation.
QUERY SECURITY	Query the security authorization of a user.
SIGNOFF	Sign off from a terminal or principal facility.
SIGNON	Sign on to a terminal.
VERIFY PASSWORD	Allow an application to check that a password matches the password recorded by an ESM for a user ID.
WRITE JOURNALNUM	Create a journal record.

For detailed information about these commands, their options, and condition information, see the *CICS Application Programming Reference* manual.

Changed EXEC CICS commands

Table 47 (Page 1 of 3). Changed EXEC CICS commands

EXEC CICS command	Option change	Condition change
ADDRESS	New option ACEE	None
ALLOCATE (APPC)	New options PARTNER and STATE	New conditions NETNAMEIDERR and PARTNERIDERR
ALLOCATE (MRO)	New option STATE(cvda)	New condition SYSIDERR
ASSIGN	New options ASRAKEY, ASRASTG, CMDSEC, INITPARM, and INITPARMLEN	None
CONNECT PROCESS	New options PARTNER and STATE	New condition PARTNERIDERR
DELETE	New option TOKEN	RESP2 values are now set
DEQ	New option MAXLIFETIME	New condition INVREQ
DUMP TRANSACTION	New option DUMPID	New conditions INVREQ, IOERR, NOSPACE, NOSTG, NOTOPEN OPENERR, and SUPPRESSED
ENQ	New option MAXLIFETIME	New condition INVREQ
ENTER TRACENUM	New option FROMLENGTH	New conditions INVREQ and LENGERR
EXTRACT PROCESS	New option MAXPROCLEN	New condition LENGERR
FREE (APPC)	New option STATE	None
FREE (MRO)	New option STATE	None

Table 47 (Page 2 of 3). Changed EXEC CICS commands		
EXEC CICS command	**Option change**	**Condition change**
FREEMAIN	New option DATAPOINTER	None
GDS ALLOCATE	New options PARTNER and STATE	New hexadecimal return codes: • 01 0C 14 — Unknown NETNAME specified on PARTNER definition • 02 0C 00 — PARTNER is not known • 06 00 00 — Unknown PROFILE specified on PARTNER definition
GDS CONNECT PROCESS	New options PARTNER and STATE	New hexadecimal return codes: • 02 0C 00 — PARTNER is not known • 03 00 — CONVID is for a session that is in use by CPI-C.
GDS EXTRACT PROCESS	New option MAXPROCLEN	New hexadecimal return codes: • 03 00 — CONVID is for a session that is in use by CPI-C • 05 00 00 00 00 20 — PROCLENGTH value returned is greater than MAXPROCLEN value.
GDS FREE, GDS ISSUE ABEND, GDS ISSUE CONFIRMATION, GDS ISSUE ERROR, GDS RECEIVE, GDS SEND, and GDS WAIT	All have the new option STATE	All have the same new hexadecimal return codes: • 03 00 — CONVID is for a session that is in use by CPI-C • 03 08 — A state check has occurred
GDS ISSUE PREPARE and GDS SIGNAL	Both have the new option STATE	Both have the same new hexadecimal return codes: • 03 00 — CONVID is for a session that is in use by CPI-C • 03 24 — A state error occurred
GETMAIN	New options CICSDATAKEY and USERDATAKEY	None
HANDLE ABEND	None	New condition NOTAUTH
ISSUE ABEND, ISSUE CONFIRMATION, ISSUE ERROR, ISSUE PREPARE, and ISSUE SIGNAL	All have the new option STATE	None
ISSUE ABORT	None	New conditions INVREQ, and SELNERR
ISSUE PASS	New options LOGMODE and NOQUIESCE	None
LINK	None	New conditions INVREQ, and PGMIDERR
LOAD	None	New conditions INVREQ, and PGMIDERR
READ	New option TOKEN	New conditions INVREQ and LOADING

EXEC CICS command	Option change	Condition change
RELEASE	None	New condition INVREQ
RETURN	None	New conditions INVREQ, and LENGERR
REWRITE	New option TOKEN	New condition INVREQ
SENDMAP	None	New condition INVREQ
START	New option USERID	New conditions INVREQ, NOTAUTH, and USERIDERR
STARTBR	None	New condition LOADING
UNLOCK	New option TOKEN	New condition INVREQ
WAITCICS and WAIT EXTERNAL	Both have the new option NAME	Both have the new condition INVREQ
WAIT CONVID	New option STATE	None
WAIT EVENT	New option NAME	New condition INVREQ
WRITE	None	New conditions LOADING, NOSPACE, and SUPPRESSED
WRITE OPERATOR	New options ACTION, NUMROUTES, and ROUTECODES	New condition INVREQ
WRITEQ TS	New option NUMITEMS	New conditions INVREQ and LENGERR
XCTL	None	New conditions INVREQ, LENGERR, and PGMIDERR

For detailed descriptions of these new options and conditions, see the *CICS Application Programming Reference* manual.

Obsolete EXEC CICS commands

The following EXEC CICS commands are obsolete:

- EXEC CICS INQUIRE and SET SYSTEM STALL. If instances of these commands are found at run time, CICS returns a null value for the INQUIRE command and takes no action for a SET command.

- EXEC CICS ADDRESS CSA. See "EXEC CICS ADDRESS CSA" on page 121 for information about what happens if a program issues an EXEC CICS ADDRESS CSA command.

Migration planning summary

In summary, CICS provides upward compatibility, at source and object level, for all CICS applications written to the CICS API, and which executed correctly under CICS for VSE/ESA Version 2.3.

The key points to remember are:

- For BMS map sets and partition sets, map DSECTs and objects are upwardly compatible.

- You are recommended to use the new CURSLOC attribute in your DFHMSD map definitions rather than the EIBCPOSN field.

- Application programs must not issue EXEC CICS ADDRESS CSA commands, or attempt to invoke CICS internal macros or control blocks. To do so causes unpredictable results.

- The DFHEICAL macro is not supported. Any programs segments that need to be assembled also need to be retranslated. The object code generated is unchanged.

- The CICS global &DFHEIMX is not supported. Remove all references to this global.

- You cannot access control blocks containing information about signed-on users. Use the EXEC CICS ADDRESS ACEE command.

- Changes to the CALLDLI interface mean you have to check and modify affected programs appropriately.

- Do not use unsupported programming methods for the write-to-operator function. Use the EXEC CICS WRITE OPERATOR command.

- Note the changes to the way CICS processes commands. Areas affected include COMMAREA processing, clearing the next TRANSID, and clearing the EIBAID field between terminal sessions.

- Review all changes to EXEC CICS commands.

Chapter 17. The system programming interface (SPI)

CICS provides upward compatibility, at source and object level for CICS application programs that are written to the system programming interface (SPI), and which executed correctly under CICS for VSE/ESA Version 2.3, except where otherwise stated in this chapter.

Creation of the system programming interface

The system programming commands are now recognized as a separate programming interface. As a consequence, a number of changes are made to the interface, as follows:

- The new SP translator option is required for all SPI commands
- Command security for all SPI commands is introduced
- Base SPOOL commands become application programming interface commands. As a result, the *CICS System Programming Reference* describes the system programming interface commands only. Descriptions of the SPOOL commands are moved to the *CICS Application Programming Reference* manual.

SP translator option required for all SPI commands

All the commands described in the *CICS System Programming Reference* are defined in the new SPI language table, DFHEITBS. Specifying the SP translator option ensures that CICS loads the SPI language table to translate an application program that contains any of the SPI commands.

Command security checking and SPI commands

In addition to the transaction attach and resource security checking, CICS provides command security checking for transactions that issue system programming commands.

Command security applies to the following EXEC CICS commands:

- ACQUIRE
- COLLECT
- CREATE
- DISABLE
- DISCARD
- ENABLE
- EXTRACT EXIT
- INQUIRE
- RESYNC
- SET

Command security checks the authority of a user to issue a system programming command. If a system programming command acts upon a specific resource, the authority of a user to access or change that resource is subject to normal resource security checking.

Command security checking is performed before resource security checking. The resource security check is not made if the command security check fails.

Changes to SPI commands

There are extensions to the system programming interface in the form of new parameters on existing commands and the addition of some new commands. There are also some extensions to CVDA values. For a summary of the new and changed commands, see the *CICS Release Guide*. For more detailed information see the *CICS System Programming Reference*.

Many of the changes are designed to provide access to CICS state data that is no longer available by accessing CICS control blocks. If you have application programs that rely upon addressability to the CSA or TCA to access CICS data, you must change these programs to use the new INQUIRE commands instead.

Note that CSA and TCA addresses are no longer passed as parameters to global user exit programs; see Chapter 18, "User exits and user-replaceable programs" on page 141 for details.

New commands

The SPI commands shown in Table 48 on page 132 are new.

Table 48 (Page 1 of 3). New SPI commands	
Command	**Description**
ACQUIRE TERMINAL	Acquires a session with a terminal.
COLLECT STATISTICS	Retrieves the current statistics for a single resource or global statistics for a class of resources.
CREATE CONNECTION	Defines a connection in the CICS local region.
CREATE FILE	Defines a file in the CICS local region.
CREATE LSRPOOL	Defines an LSR pool in the CICS local region.
CREATE MAPSET	Defines a mapset in the CICS local region.
CREATE PARTITIONSET	Defines a partition set in the CICS local region.
CREATE PARTNER	Defines a partner in the CICS local region.
CREATE PROFILE	Defines a profile in the CICS local region.
CREATE PROGRAM	Defines a program in the CICS local region.
CREATE SESSIONS	Defines a session in the CICS local region.
CREATE TERMINAL	Defines a terminal in the CICS local region.
CREATE TRANCLASS	Defines a transaction class in the CICS local region.
CREATE TRANSACTION	Defines a transaction in the CICS local region.

Table 48 (Page 2 of 3). New SPI commands	
Command	**Description**
CREATE TYPETERM	Defines a typeterm in the CICS local region.
DISCARD AUTINSTMODEL	Removes a terminal autoinstall model definition from the executing CICS system.
DISCARD FILE	Removes a file definition from the executing CICS system.
DISCARD PARTNER	Removes a partner definition from the executing CICS system.
DISCARD PROFILE	Removes a profile definition from the executing CICS system.
DISCARD PROGRAM	Removes a program, map set, or partition set definition from the executing CICS system.
DISCARD TRANCLASS	Removes a transaction class definition from the executing CICS system.
DISCARD TRANSACTION	Removes a transaction definition from the executing CICS system.
INQUIRE AUTINSTMODEL	Finds out whether an autoinstall model is installed.
INQUIRE DELETSHIPPED	Retrieves information about system settings that control the CICS timeout delete mechanism.
INQUIRE DSNAME	Retrieves information about a data set name block.
INQUIRE EXITPROGRAM	Retrieves information about a user exit.
INQUIRE MONITOR	Retrieves the status of CICS monitoring.
INQUIRE PARTNER	Retrieves information about a partner.
INQUIRE PROFILE	Determines whether a transaction profile is installed.
INQUIRE STATISTICS	Retrieves statistics information.
INQUIRE STORAGE	Retrieves information about task storage.
INQUIRE SYSDUMPCODE	Retrieves information about a system dump table entry.
INQUIRE TRACEFLAG	Retrieves information about trace flags.
INQUIRE TRACETYPE	Retrieves information about CICS system tracing.
INQUIRE TRANCLASS	Retrieves information about a transaction class.
INQUIRE TRANDUMPCODE	Retrieves information about a transaction dump code.
INQUIRE TSQUEUE	Retrieves information about a temporary storage queue.
PERFORM DELETSHIPPED	Deletes inactive shipped terminal definitions.

Table 48 (Page 3 of 3). New SPI commands	
Command	**Description**
PERFORM DUMP	Requests a system dump of CICS.
PERFORM RESETTIME	Resets the CICS date and time.
PERFORM SECURITYREBUILD	Refreshes security information.
PERFORM SHUTDOWN	Shuts down the CICS system.
PERFORM STATISTICS RECORD	Records statistics immediately.
SET DELETSHIPPED	Changes the system settings that control automatic deletion of shipped terminal definitions.
SET DSNAME	Changes the backout status of a data set, or removes a data set from CICS.
SET MONITOR	Changes CICS monitoring options.
SET STATISTICS	Changes the recording of CICS statistics.
SET SYSDUMPCODE	Changes an entry in the system dump table.
SET TRACEFLAG	Changes the settings of trace flags.
SET TRACETYPE	Changes the tracing levels of CICS components.
SET TRANCLASS	Sets the limits for a transaction class.
SET TRANDUMPCODE	Changes entries in the transaction dump table.

See the *CICS System Programming Reference* for full details about these new commands.

Changed commands

The commands shown in Table 49 are changed.

Table 49 (Page 1 of 4). Summary of changes to SPI commands		
Command	**Option changes**	**Condition changes**
DISABLE PROGRAM	FORMATEDF and SHUTDOWN added (task-related user exits only)	RESP2 values of 100 and 101 (NOTAUTH) and 7 (PGMIDERR) added
ENABLE PROGRAM	FORMATEDF, LINKEDITMODE, and SHUTDOWN added	RESP2 values of 100 and 101 (NOTAUTH) added
EXTRACT EXIT	No new options added	RESP2 values of 100 and 101 (NOTAUTH) added
INQUIRE AUTOINSTALL	No new options added	RESP2 value of 100 (NOTAUTH) added
INQUIRE CONNECTION	CONNTYPE and ZCPTRACING added	RESP2 value of 100 (NOTAUTH) added

Table 49 (Page 2 of 4). Summary of changes to SPI commands		
Command	**Option changes**	**Condition changes**
INQUIRE DUMPDS	INITIALDDS added	RESP2 value of 100 (NOTAUTH) added
INQUIRE FILE	FWDRECSTATUS, CATNAME, and REMOTETABLE options added	RESP2 values 100 and 101 (NOTAUTH) added
INQUIRE IRC	No new options added	RESP2 value of 100 (NOTAUTH) added
INQUIRE JOURNALNUM	ARCHSTATUS added	No new conditions added
INQUIRE MODENAME	No new options added	RESP2 value of 100 (NOTAUTH) added
INQUIRE PROGRAM	CEDFSTATUS, COPY, EXECKEY, HOLDSTATUS, LANGDEDUCED, and SHARESTATUS options added	RESP2 values of 100 and 101 (NOTAUTH) added
INQUIRE REQID	No new options added	RESP2 value of 101 changed to 100 (NOTAUTH), and END (RESP2 of 2) and ILLOGIC (RESP2 of 1) removed
INQUIRE SYSTEM	CDSASIZE, CICSTSLEVEL, CMDPROTECT, DFLTUSER, DSALIMIT, DUMPING, ECDSASIZE, EDSALIMIT, ERDSASIZE, ESDSASIZE, EUDSASIZE, PROGAUTOCTLG, PROGAUTOEXIT, PROGAUTOINST, PRTYAGING, RDSASIZE, REENTPROTECT, SDSASIZE, STOREPROTECT, and UDSASIZE options are added. A new CVDA of CANCELLED is added to the SHUTSTATUS option. New CVDAs of SOS and SOSABOVE are added to the SOSSTATUS option. The AMAXTASKS, CUSHION, and STALL options are obsolete.	RESP2 value of 100 (NOTAUTH) added
INQUIRE TASK	CMDSEC, DTB, DTIMEOUT, DUMPING, PROFILE, PROGRAM, PURGEABILITY, REMOTENAME, REMOTESYSTEM, RESSEC, ROUTING, RTIMEOUT, RUNAWAY, SCRNSIZE, STORAGECLEAR, SUSPENDTIME, SUSPENDTYPE, SUSPENDVALUE, TASKDATAKEY, TASKDATALOC, TRACING, TRANCLASS, TRANPRIORITY, TRPROF, and TWASIZE options added	RESP2 of 3 and 10 (INVREQ), RESP2 of 100 (NOTAUTH), and RESP2 of 2 (TASKIDERR) added
INQUIRE TASKLIST	RUNNING	RESP2 of 100 (NOTAUTH) added
INQUIRE TCLASS	No new options added	RESP2 of 100 (NOTAUTH) added
INQUIRE TDQUEUE	No new options added	RESP2 of 100 and 101 (NOTAUTH) added
INQUIRE TERMINAL	MAPNAME, MAPSETNAME, TRACING, USERNAME, and ZCPTRACING options added	RESP2 of 100 (NOTAUTH) added

Command	Option changes	Condition changes
INQUIRE TRACEDEST	SWITCHSTATUS option added	RESP2 of 100 (NOTAUTH) added
INQUIRE TRANSACTION	CMDSEC, DTB, TASKDATAKEY, TASKDATALOC, TRANCLASS, and TRACING options added	RESP2 of 3 (INVREQ) and RESP2 of 100 and 101 (NOTAUTH) added
INQUIRE VTAM	PSDINTERVAL and PSDINTHRS options added	RESP2 of 100 (NOTAUTH) added
RESYNC ENRTYNAME	QUALIFIER option added	RESP2 of 100 (NOTAUTH) added
SET AUTOINSTALL	No new options added	RESP2 of 100 (NOTAUTH) added
SET CONNECTION	New CVDAs CANCEL and FORCECANCEL (on PURGETYPE option), and ZCPTRACING option added	RESP2 of 13, 14, 22 and 23 (INVREQ), and RESP2 of 100 (NOTAUTH) added
SET DUMPDS	INITIALDDS option added	RESP2 of 1 (INVREQ), RESP2 of 4 (IOERR) and RESP2 of 100 (NOTAUTH) added
SET FILE	DSNAME, MAXNUMRECS, and TABLE	RESP2 of 29-31, 34, and 37-39 (INVREQ), and RESP2 of 100 and 101 (NOTAUTH) added
SET IRC	No new options added	RESP2 of 18 (INVREQ), and RESP2 of 100 (NOTAUTH) added. RESP2 of 3,16, and 20 (INVREQ) obsolete.
SET JOURNALNUM	No new options added	RESP2 of 3 (INVREQ), RESP2 of 7 and 8 (IOERR), and RESP2 of 100 and 101 (NOTAUTH) added
SET MODENAME	No new options added	RESP2 of 100 (NOTAUTH) added. RESP2 of 2 (INVREQ) obsolete.
SET PROGRAM	CEDFSTATUS, COPY, PHASEIN, SHARESTATUS, and VERSION options added	RESP2 of 4-6, 9, and 17-19 (INVREQ), RESP2 of 8 (IOERR), and RESP2 of 100 and 101 (NOTAUTH) added. RESP2 of 3 (ERROR) obsolete

Table 49 (Page 3 of 4). Summary of changes to SPI commands

Table 49 (Page 4 of 4). Summary of changes to SPI commands

Command	Option changes	Condition changes
SET SYSTEM	DSALIMIT, DUMPING, EDSALIMIT, NEWMAXTASKS, MROBATCH, PROGAUTOCTLG, PROGAUTOEXIT, PROGAUTOINST, and PRTYAGING options added The options AMAXTASKS, CUSHION, and STALL are obsolete	RESP2 of 14, 20-23 (INVREQ), RESP2 of 16 (NOSTG), and RESP2 of 100 and 101 (NOTAUTH) added. RESP2 2, 4, 10 and 11 (INVREQ) are obsolete
SET TASK	PRIORITY option added	RESP2 of 4 (INVREQ), RESP2 of 2 (TASKIDERR), and RESP2 of 100 (NOTAUTH) added. RESP2 6 (INVREQ) is obsolete
SET TCLASS	No new options added	RESP2 of 100 (NOTAUTH) added
SET TDQUEUE	ATIUSERID option added	RESP2 of 8, 9, 15, 16, 19, 20-22 (INVREQ), RESP2 of 14 and 17 (IOERR), RESP2 of 23-25, 27, 100-102 (NOTAUTH), and RESP2 of 28 (USERIDERR) added
SET TERMINAL	MAPNAME, MAPSETNAME, OPERID, TRACING, and ZCPTRACING options added	RESP2 of 22, 26, 28, 29, 37, 46 and 57 (INVREQ), and RESP2 of 100 (NOTAUTH) added. RESP2 of 3, 8, 10, 12, 14, 16, 20, 47 and 49 (INVREQ) are obsolete.
SET TRACEDEST	SWITCHSTATUS and TABLESIZE options added	RESP2 of 2 and 4 (INVREQ), RESP2 of 10 (IOERR), RESP2 of 7 (NOSPACE), and RESP2 of 100 (NOTAUTH) added RESP2 of 8 (NOSTG)
SET TRANSACTION	RUNAWAY, RUNAWAYTYPE, SHUTDOWN, TRANCLASS, and TRACING options added	RESP2 of 7-14 (INVREQ), and RESP2 of 100 and 101 (INVREQ) added. RESP2 of 1 and 6 (INVREQ) are obsolete
SET VTAM	PSDINTERVAL, PSDINTHRS, PSDINTMINS, and PSDINTSECS options added	RESP2 of 4-14 (INVREQ), and RESP2 of 100 (NOTAUTH) added

See the *CICS System Programming Reference* for detailed information about these commands.

Changes to CICS system programs

The following list of changes might affect your CICS system programs.

Monitoring data format changes

Enhancements to CICS monitoring mean that the monitoring data formats are not the same as those in CICS for VSE/ESA Version 2.3. Programs that process monitoring data, with or without the IBM-supplied dictionary, are not compatible between CICS for VSE/ESA Version 2.3 and CICS TS Release 1. In addition, the CICS monitoring output is now sent to DMF data sets only.

Modify any online monitoring programs to access the information they need. In some cases, the information they have previously used may not be available; some program redesign may be necessary.

See Chapter 27, "Monitoring" on page 217 for more information.

Master terminal programmable interface

The DFHEMTA programmable interface to CEMT[4] (master terminal transaction) is unchanged except for some changes to trace keywords. You can invoke the same requests as on CICS for VSE/ESA Version 2.3, provided that:

- The request does not use any abbreviations of commands
- You use only supported CEMT commands (see "Changes to existing CEMT commands" on page 158).

The return codes are compatible with the return codes on CICS for VSE/ESA Version 2.3. However, because of the changes in CICS trace, CEMT INQUIRE and SET commands for trace are modified. The keyword for the internal trace facility is now INTTRACE. The same compatibility statements apply to DFHEMTP.

Trace entries

There are significant changes to the contents of CICS trace entries and to the way trace information is presented. This is especially true of trace information produced by the restructured parts of CICS (the new domains). Any programs that interface to CICS trace mechanisms online, or process trace information offline, must be reviewed and rewritten to take these changes into account. Some redesign work may be necessary.

See Chapter 24, "CICS trace" on page 197.

Dump content and format

There are significant changes to the contents and format of CICS dumps. This is especially true of dump information produced by the restructured parts of CICS. Any programs that interface to CICS dump mechanisms online, or that process dump information offline, must be reviewed and rewritten to take these changes into account. Some redesign work may be necessary.

---

4 The use of this old programmable interface to the master terminal program, DFHEMTA, is supported for compatibility purposes only. You are strongly recommended to use the equivalent EXEC CICS INQUIRE|SET commands instead, and retain the old programmable interface only where no equivalent API command is available. The documentation for this interface is available only in the CICS libraries for earlier releases.

See Chapter 25, "CICS dump facility" on page 201.

Statistics content and format

There are significant changes to the content and format of CICS statistics. This is especially true of statistics information produced by the new CICS domains. Any programs that interface to CICS statistics collection mechanisms online, or that process statistics offline, must be reviewed and rewritten to take these changes into account. Some redesign work may be necessary. In addition, the CICS statistics output is now sent to DMF data sets only.

See Chapter 28, "Statistics" on page 223 for more information.

Resource definition changes

Programs that interface directly to CICS resource definitions are affected by changes. Some resource definition macros and their corresponding tables are withdrawn; the use of RDO is now required, and the resource definitions are accessible only by using the documented interfaces.

For more information, see Chapter 13, "Resource definition online" on page 87.

Program loading

Because of changes to the CICS mechanisms that control program loading, you must review and rewrite any programs that depend on assumptions about these mechanisms.

Initialization

CICS initialization is changed because of the changes to the structure and operating characteristics of CICS. Programs that interact with CICS during initialization and rely on the previous logical order of CICS initialization, or on the use of system initialization overlay modules (SIMODS), must be changed (SIMODS are no longer supported).

See Chapter 11, "Initialization" on page 65 for more information.

System recovery

Programs that extend the recovery capabilities of CICS and rely on the current CICS use of the SRT are affected by changes to recovery processing in the restructured parts of CICS. Also, these and other programs, such as monitors operating outside the CICS region, may be affected by the CICS XRF=YES option.

Messages and codes

The messages and codes used by CICS have changed significantly to allow for functional changes to CICS, the restructure of some CICS code, and to enhance the information given. You may need to change programs that depend on particular CICS messages. For example, if you use an automatic operator program that responds to CICS messages, you must check each message to see how it has been affected by these changes and reflect these changes in your operator program.

See Chapter 26, "CICS messages and codes" on page 205 for more information.

There are also some new CICS abend codes, and some abend codes are deleted. You may need to change programs that depend on particular CICS abend codes. If you use system recovery exit programs, check these to ensure that the abend codes you use are still correct.

See "VSE user abend codes" on page 211 for more information.

Restructured CICS – the new domains

Selected parts of CICS have been restructured into a number of domains that communicate with the rest of the system and with external applications by means of strictly-defined interfaces. More CICS modules are loaded above 16MB and run in 31-bit addressing mode. More of these modules are also supplied in object-serviced form or as object-code only. See "The new CICS structure" on page 51 for more information.

CICS termination – normal

CICS file control is invoked during normal shutdown processing to explicitly close all files (VSAM and DAM) that are open and known to file control. This orderly closing of files is done by a call to DFHFCSD during phase two of termination.

Migration planning summary

In summary, CICS generally provides upward compatibility, at source and object level for CICS applications written to the SPI, and which executed correctly under CICS for VSE/ESA Version 2.3 using a supported language.

The key points to remember are:

- The new translator option is required for all SPI commands.

- Command security for all SPI commands is introduced.

- The base SPOOL commands become API commands.

- Review the changes to SPI commands, and how they might affect your CICS system programs.

Chapter 18. User exits and user-replaceable programs

This chapter covers the following topics:

- Global user exits
- "The exit programming interface (XPI)" on page 148
- "Task-related user exits" on page 150
- "Changes to user-replaceable programs" on page 151
- "Migration planning summary" on page 153

Global user exits

If you need to extend and customize CICS in ways not provided within the standard CICS system, you will find significant improvements to the CICS global user exit interface that make it work more efficiently, and allow you to use more CICS facilities from within user exits.

However, these improvements have made it necessary to standardize the global user exit interface. The linkage mechanism now follows the general linkage conventions for registers and parameter lists. Rewrite your global user exit programs to ensure that they conform to the new interface, and that they can run in a 31-bit addressing environment. Global user exits written to the interface available in CICS for VSE/ESA Version 2.3 will not work correctly when you migrate.

Changes have been made to the exit points available, and to the functions for which you use them. CICS also provides a new exit programming interface (XPI). For detailed information about global user exits and the new XPI, see the *CICS Customization Guide*.

Summary of changes to global user exits

The following list summarizes the changes to the global user exit interface:

- Registers and parameter lists are standardized, and standard return code equates are provided for all global user exits. Standard names for the return codes are provided where the same return code meaning is used at more than one exit point. This makes the exit programs independent of specific values. Standards conform to VSE linkage conventions.

- Exit programs must be written to allow for the 31-bit addressing of assembler-language calls that invoke some CICS services.

- No parameters are passed in registers.

- The standard global user exit parameter list, which is mapped by the DFHUEPAR DSECT and generated by the DFHUEXIT macro, is changed by the addition of the following new DFHUEPAR parameters:

    - Address of the stack entry (required if you use the XPI)
    - Address of the storage for the XPI parameters
    - Address of the trace flag
    - Address of the exit-specific parameters
    - Address of the caller's task indicators (data location and key)

An individual exit may not provide all of this information. For more information, see the *CICS Customization Guide*.

- The register 1 parameter list mechanism is extended to pass standard and exit-specific parameters.

- A new exit programming interface (XPI) is provided. The XPI is a set of macro function calls that can be used in global user exits to access particular CICS services.

- New global user exits are added in the restructured parts of CICS. For example, in the dispatcher, dump, message, monitor, and statistics domains. The restructuring effort has led to some parts of CICS behaving differently, meaning that some user exits can no longer be provided.

- All exits, including the new global user exits in domains, can be enabled by using an EXEC CICS ENABLE command. Transaction backout exits can also be enabled using the TBEXITS system initialization parameter. The EXITS system initialization option is withdrawn.

- A new PLT phase at initialization executes before recovery, to allow exits to be enabled. Using the DFHDELIM entry, reassemble your PLT to separate this new first phase from the second.

- The exit handling mechanism is changed. Check that your programs do not rely on any assumptions about exit-handling (for example, the internal exit numbers). The exit numbers associated with the exit identifiers in the DFHUEXIT TYPE=EXITIDS macro are not guaranteed from release to release. Rewrite any programs from previous releases that relied on such assumptions.

- The UEPCSA and UEPTCA parameters are reserved fields, and are defined as follows:

```
UEPTCA   DS    A              (reserved)
UEPCSA   DS    A              (reserved)
```

These two fields point to fetch-protected storage in all the AP domain global user exit points. Any reference to these fields in AP domain global user exit programs causes an ASRD abend at runtime. For all the other domain global user exits, the fields are set to zero values as in earlier releases.

You should re-examine your reasons for using these parameters, and where applicable choose a suitable alternative method to access the information you require.

If you have used the CSA and TCA to gain addressability to other CICS control blocks in order to obtain CICS state data, you must now use an exit-specific parameter or an XPI call.

Summary of global user exit points

Table 50 on page 143 shows the global user exits with a brief description of where or when they are invoked. Although many are new, you should still check your usage of exits already in existence as new parameters may have been added to them (such as XPI parameters).

Table 50 (Page 1 of 5). Alphabetical list of global user exit points

Exit name	Module or domain	Where or when invoked	Status
XAKUSER	Activity keypoint program	Immediately before the 'end of keypoint' record is written.	New
XALCAID	Terminal allocation program	Whenever an AID with data is canceled.	New
XALTENF	Terminal allocation program	When an ATI request from transient data or interval control requires a terminal that is unknown in this system.	Changed
XDBDERR	Dynamic transaction backout program	When the DL/I backout routine detects an error.	Changed
XDBFERR	Dynamic transaction backout program	If the dynamic transaction backout program or the file control program detects an error.	Changed
XDBIN	Dynamic transaction backout program	Each time CICS reads a non-DL/I dynamic log record.	Changed
XDBINIT	Dynamic transaction backout program	On entry to the dynamic transaction backout program.	Changed
XDSAWT	Dispatcher domain	After an operating system wait.	New
XDSBWT	Dispatcher domain	Before an operating system wait.	New
XDTAD	Shared data tables management program	When a write request is issued to a data table.	Changed
XDTLC	Shared data tables management program	At the completion of loading of a data table.	Changed
XDTRD	Shared data tables management program	During the loading of a data table, whenever a record is retrieved from the source data set.	Changed
XDUCLSE	Dump domain	After the domain closes a transaction dump data set.	New
XDUOUT	Dump domain	Before the domain writes a record to the transaction dump data set.	New
XDUREQ	Dump domain	Before the domain takes a system or transaction dump.	New
XEIIN	EXEC interface program	Before the execution of an EXEC CICS command.	Changed
XEIOUT	EXEC interface program	After the execution of an EXEC CICS command.	Changed
XFCAREQ	File control EXEC interface program	Before CICS processes a file control SPI request.	New
XFCAREQC	File control EXEC interface program	After CICS processes a file control SPI request.	New
XFCNREC	File control open/close program	When a mismatch is detected between the backout recovery setting for a file and its associated data set during file open processing.	New

Table 50 (Page 2 of 5). Alphabetical list of global user exit points			
Exit name	**Module or domain**	**Where or when invoked**	**Status**
XFCREQ	File control EXEC interface program	Before CICS processes a file control API request.	Changed
XFCREQC	File control EXEC interface program	After a file control API request has completed.	New
XFCSREQ	File control file state program	Before a file OPEN, CLOSE, ENABLE, or DISABLE command is attempted.	Changed
XFCSREQC	File control file state program	After a file OPEN, CLOSE, ENABLE, or DISABLE command has been completed.	Changed
XGMTEXT	"Good morning" message program	Before the "good morning" message is sent.	Changed
XICEREQ	Interval control EXEC interface program	Before CICS processes an interval control API request.	New
XICEREQC	Interval control EXEC interface program	After an interval control API request has completed.	New
XICEXP	Interval control program	After expiry of an interval control time interval.	Changed
XICREQ	Interval control program	At the start of the interval control program, before request analysis.	Changed
XICTENF	Interval control program	When an EXEC CICS START command requires a terminal that is unknown in this system.	Changed
XISCONA	Intersystem communication program	After an attempt to allocate a session for function shipping fails because no sessions are immediately available.	New
XISLCLQ	Intersystem communication program	After: • An attempt to allocate a session for a function-shipped START NOCHECK request fails because the remote system is not in service • A connection to the remote system cannot be established • No sessions are immediately available and your XISCONA exit program has specified that the request is not to be queued in the issuing region.	Changed
XJCWB	Journal control program	Before each physical WRITE to each journal.	New
XJCWR	Journal control program	After building a journal record in the buffer, but before writing it.	Changed
XKCREQ	Task control program	Before an ENQUEUE or DEQUEUE request.	Changed

Table 50 (Page 3 of 5). Alphabetical list of global user exit points

Exit name	Module or domain	Where or when invoked	Status
XMEOUT	Message domain	Before a message is sent from the message domain to its destination.	New
XMNOUT	Monitoring domain	Before a record is either written to DMF or buffered before a write to DMF.	New
XPCABND	Program control program	Before a dump call is made.	Changed
XPCFTCH	Program control program	Before an application program is given control.	Changed
XPCHAIR	Program control program	Before a HANDLE ABEND routine is given control.	New
XPCREQ	Program control program	Before a LINK request is processed.	Changed
XPCREQC	Program control program	After a LINK request has been completed.	Changed
XPCTA	Program control program	After an abend occurs, and before the environment is modified.	New
XRCDBER	DL/I backout program	When an error condition has been returned from the DL/I control program during backout processing, or if an error has been detected by DFHDLBP itself.	Changed
XRCINIT	DL/I backout program	At the beginning and end of the DL/I backout program.	Changed
XRCINIT	File control backout program	At the beginning and end of the file control backout program.	Changed
XRCINIT	Message and ISC state recovery program	At the beginning and end of the message and ISC state recovery program.	Changed
XRCINIT	User backout program	At the beginning and end of the user backout program.	Changed
XRCINPT	File control backout program	Whenever a non-DL/I record is read from the restart data set.	Changed
XRCINPT	Message and ISC state recovery program	Whenever a non-DL/I record is read from the restart data set.	Changed
XRCINPT	User backout program	Whenever a non-DL/I record is read from the restart data set.	Changed
XRCFCER	File control backout program	When the file control program returns an error during backout processing.	Changed
XRCOPER	File control backout program	If an error occurs while opening a file control data set.	Changed
XRMIIN	Resource manager interface program	Before execution of an EXEC SQL or RMI command.	New
XRMIOUT	Resource manager interface program	After execution of an EXEC SQL or RMI command.	New

Table 50 (Page 4 of 5). Alphabetical list of global user exit points			
Exit name	**Module or domain**	**Where or when invoked**	**Status**
XRSINDI	Resource management modules	Immediately after a successful install or discard of a resource.	New
XSNOFF	Security manager domain	After a terminal user signs off.	New
XSNON	Security manager domain	After a terminal user signs on.	New
XSRAB	System recovery program	When the system recovery program finds a match for a VSE abend code in the SRT.	New
XSTERM	System termination program	During a normal system shutdown, immediately before TD buffers are cleared.	New
XSTOUT	Statistics domain	Before a statistics record is written to DMF.	New
XSZARQ	Front End Programming Interface	After a FEPI request has completed.	New
XSZBRQ	Front End Programming Interface	Before a FEPI request is actioned.	New
XTCATT	Terminal control program	Before task attach.	Changed
XTCIN	Terminal control program	After an input event.	Changed
XTCOUT	Terminal control program	Before an output event.	Changed
XTDEREQ	Transient data EXEC interface program	Before CICS processes a transient data API request.	New
XTDEREQC	Transient data EXEC interface program	After a transient data API request has completed.	New
XTDIN	Transient data program	After receiving data from SAM (extrapartition) or VSAM (intrapartition).	Changed
XTDOUT	Transient data program	Before passing data to SAM (extrapartition) or VSAM (intrapartition).	Changed
XTDREQ	Transient data program	Before request analysis.	Changed
XTSEREQ	Temporary storage EXEC interface program	Before CICS processes a temporary storage API request.	New
XTSEREQC	Temporary storage EXEC interface program	After a temporary storage API request has completed.	New
XTSIN	Temporary storage control program	After an input event.	Changed
XTSOUT	Temporary storage control program	Before an output event.	Changed
XTSREQ	Temporary storage control program	Before request analysis.	Changed
XXMATT	Transaction manager domain	When a user transaction is attached.	New
XXRSTAT	XRF request processing program	After a VTAM failure or a predatory takeover.	Changed
XZCATT	VTAM terminal management program	Before task attach.	Changed
XZCIN	VTAM working set module	After an input event.	Changed
XZCOUT	VTAM working set module	Before an output event.	Changed

Table 50 (Page 5 of 5). Alphabetical list of global user exit points			
Exit name	**Module or domain**	**Where or when invoked**	**Status**
XZCOUT1	VTAM working set module	Before a message is broken into RUs.	Changed
XZIQUE	VTAM working set module	1. When an allocate request for a session is about to be queued. 2. When an allocate request succeeds following previous suppression of queuing.	New

See the *CICS Customization Guide* for detailed information about these global user exits.

Obsolete exits

The following exit points are obsolete:

Table 51. Obsolete user exits	
Exit	**Location**
XFCIN	Located in the file control module, DFHFCP, and invoked just before the input event.
XFCINC	Located in the file control module, DFHFCP, and invoked by modules DFHFCVS and DFHFCBD after the input event.
XFCOUT	Located in the file control module, DFHFCP, and invoked before the output event.
XKCDISP	Located in the task control module DFHKCP, and invoked before task dispatch.
XSCREQ	Located in the storage control program DFHSCP, and invoked before request analysis.
XTCRDAT	Located in the terminal control program DFHTCP, and invoked after 2741 read attention.
XKCBWT and XKCAWT	Replaced by the new exits XDSBWT and XDSAWT respectively.
The task-related user exit point located in the monitoring program (DFHCMP)	The restructure of CICS monitoring means that it is replaced by the global user exit point, XMNOUT, in the monitoring (MN) domain. If you use a monitoring task-related user exit on your present CICS system, you must rewrite it to conform to the global user exit interface.

Reassembling global user exit programs

The CICS global user exit programming interface is product sensitive, and is dependent on the implementation of CICS code from release to release. All global user exit programs must be reassembled, using the CICS TS Release 1 libraries, after you have modified them for any changes to parameters.

Note the changes summarized in this chapter (and described in greater details in the *CICS Customization Guide*) and modify your global user exit programs accordingly. Note particularly that:

- The standard global user exit parameter list is changed for all global user exits.

- The exit-specific parameter lists are new for all global user exit points.

The exit programming interface (XPI)

A new exit programming interface (XPI) is introduced to enable you to use CICS domain services from global user exit programs.

The CICS XPI gives you access to a set of CICS services for exit programs; the interface consists of a set of calls to CICS domains listed in Table 52 on page 148. The XPI is different from CICS macro- and command-level programming because it does not need the usual CICS transaction environment, although it is dependent on a special exit programming environment. To set up this special programming environment, include the CICS-supplied exit macro, DFHUEXIT, at the beginning of your exit program.

The XPI can be used by assembler-language global user exit programs, which must be in 31-bit addressing mode when making XPI calls. They can reside above 16MB.

Because XPI calls use the services of the new CICS domains, there are limits to their use in global user exit programs invoked from domains. Global user exit programs must observe the restrictions described in the *CICS Customization Guide*. Otherwise, exit programs may behave unpredictably and this could in turn affect the operation of CICS. In particular, when using a domain service in an exit from the same domain, follow the published guidance about preventing recursion.

Table 52 lists the CICS XPI calls to servicing domains.

Table 52 (Page 1 of 3). CICS XPI calls to servicing domains			
Domain	**Call**	**Function**	**Description**
Dispatcher	DFHDSSRX	ADD_SUSPEND	Obtains a suspend token for a task
Dispatcher	DFHDSSRX	DELETE_SUSPEND	Releases a suspend token associated with a task
Dispatcher	DFHDSSRX	SUSPEND	Suspends execution of the issuing task
Dispatcher	DFHDSSRX	RESUME	Resumes execution of a suspended task
Dispatcher	DFHDSSRX	WAIT_EXTERNAL	Requests a wait on one or more VSE ECBs
Dispatcher	DFHDSATX	CHANGE_PRIORITY	Changes the priority of an issuing task
Dump	DFHDUDUX	SYSTEM_DUMP	Requests a system dump
Dump	DFHDUDUX	TRANSACTION_DUMP [1]	Requests a transaction dump
Kernel	DFHKEDSX	START_PURGE_PROTECTION	Inhibits purge for current task
Kernel	DFHKEDSX	STOP_PURGE_PROTECTION	Reenables purge for current task
Loader	DFHLDLDX	DEFINE_PROGRAM	Defines new program to LD domain
Loader	DFHLDLDX	ACQUIRE_PROGRAM	Loads a program, or, if it is already loaded, obtain its load and entry point addresses
Loader	DFHLDLDX	RELEASE_PROGRAM	Releases storage occupied by a program, or decrement its use count by one
Loader	DFHLDLDX	DELETE_PROGRAM	Deletes a program definition from the list of current programs

Table 52 (Page 2 of 3). CICS XPI calls to servicing domains

Domain	Call	Function	Description
Monitoring	DFHMNMNX	INQUIRE_MONITORING_DATA [1]	Processes a user event monitoring point (EMP)
Monitoring	DFHMNMNX	MONITOR [1]	Retrieves the current monitoring data for the issuing task
Program manager	DFHPGISX	INQUIRE_PROGRAM	Retrieves information about the attributes of a specified program
Program manager	DFHPGISX	INQUIRE_CURRENT_PROGRAM	Retrieves information about the attributes of the program that is currently running
Program manager	DFHPGISX	SET_PROGRAM	Sets selected attributes in the definition of a specified program
Program manager	DFHPGISX	START_BROWSE_PROGRAM	Retrieves a token that enables users to begin browsing through program definitions, optionally starting at the definition of a specified program
Program manager	DFHPGISX	GET_NEXT_PROGRAM	Retrieves the next program definition during a browse sequence initiated by the START_BROWSE_PROGRAM call
Program manager	DFHPGISX	END_BROWSE_PROGRAM	Ends a browse of program definitions initiated by the START_BROWSE_PROGRAM call
Program manager	DFHPGAQX	INQUIRE_AUTOINSTALL	Retrieves the settings of the autoinstall function for programs, map sets, and partition sets
Program manager	DFHPGAQX	SET_AUTOINSTALL	Changes the settings of the autoinstall function for programs, map sets, and partition sets
State data access	DFHAPIQX	INQ_APPLICATION_DATA	Retrieves application system data in the AP domain
State data access	DFHSAIQX	INQUIRE_SYSTEM	Retrieves CICS system data in the AP domain
State data access	DFHSAIQX	SET_SYSTEM	Sets CICS system data values in the AP domain
Storage manager	DFHSMMCX	GETMAIN	Obtains and initializes storage
Storage manager	DFHSMMCX	FREEMAIN	Releases storage acquired using a GETMAIN call
Storage manager	DFHSMSRX	INQUIRE_ACCESS	Retrieves the access key of an element of storage specified by start address and length
Storage manager	DFHSMMCX	INQUIRE_ELEMENT_LENGTH	Retrieves the start address and length of an element in task lifetime storage
Storage manager	DFHSMSRX	INQUIRE_SHORT_ON_STORAGE	Discovers whether CICS is short on storage
Storage manager	DFHSMMCX	INQUIRE_TASK_STORAGE	Inquire about a task's lifetime storage
Trace	DFHTRPTX	TRACE_PUT	Writes a trace entry to the active trace destinations
Transaction manager	DFHXMSRX	INQUIRE_DTRTRAN	Retrieves the name of the dynamic transaction routing transaction definition
Transaction manager	DFHXMSRX	INQUIRE_MXT	Retrieves the current value of the MXT system initialization parameter
Transaction manager	DFHXMCLX	INQUIRE_TCLASS	Retrieves data about a specified transaction class

Domain	Call	Function	Description
Transaction manager	DFHXMXDX	INQUIRE_TRANDEF	Retrieves data about a specified transaction definition
Transaction manager	DFHXMIQX	INQUIRE_TRANSACTION	Retrieves data about an attached transaction definition
Transaction manager	DFHXMIQX	SET_TRANSACTION	Changes the task priority and transaction class of the current task
User journaling	DFHJCJCX	WRITE_JOURNAL_DATA [1]	Writes a record to a CICS journal

Table 52 (Page 3 of 3). CICS XPI calls to servicing domains

Notes for Table 52 on page 148:

[1]   There is a restriction on using the XPI early during initialization. The XPI INQUIRE_MONITOR_DATA, MONITOR, TRANSACTION_DUMP, and WRITE_JOURNAL_DATA functions should not be used in exit programs enabled during the first phase of the PLTPI. Information about the PLTPI is given in the *CICS Customization Guide*.

Task-related user exits

The CICS task-related user exit programming interface (also known as the resource manager interface or RMI) is used primarily by CICS application programs to access external resource managers. It:

* Enables full recursion, which means that you can issue a resource manager request from within a task-related user exit that is already processing another request for the same or a different resource manager. For example, you can issue an SQL(*) request from within a DB2® for VSE task-related user exit while it is processing another SQL request.

* Introduces a new option, LINKEDITMODE, on the EXEC CICS ENABLE command, to invoke a task-related user exit in its link-edit AMODE instead of having to invoke it in the same AMODE as its original caller. If you do not specify the LINKEDITMODE option, your task-related user exits are invoked in the same AMODE as their original callers. A task-related user exit link-edited as AMODE(31),RMODE(ANY) and enabled with the LINKEDITMODE option of the EXEC CICS ENABLE command is placed with its associated control blocks, parameter lists, and work areas above the 16MB line.

* Passes parameters to task-related user exits or to application programs using the new system initialization parameter INITPARM. For example, you can use INITPARM to pass parameters to a PLTPI program to be executed in the final stage of CICS initialization; the parameters are retrieved using an EXEC CICS ASSIGN INITPARM command.

* Supports command-level API and SPI commands.

* Denies direct access to control blocks by task-related user exit programs.

* Enables a task-related user exit program to call itself recursively with DFHRMCAL.

The UEPCSA and UEPTCA parameters are reserved fields. As for global user exits, these two fields point to fetch-protected storage. Any reference to these fields in a task-related user exit results in an ASRD abend at run time.

Re-examine your reasons for using these parameters, and where applicable choose a suitable alternative method to access the information you require.

If your task-related user exit programs use the CSA and the TCA to gain addressability to other CICS control blocks in order to obtain state data, change them to use the CICS API or SPI command-level interface instead.

Changes to user-replaceable programs

All user-replaceable programs:

- Must be written to command-level standards.

- Must not access internal CICS control blocks. Command-level API and SPI commands can be used.

- Can be written in any language supported by CICS, except for the user-replaceable journaling programs, DFHXJCC and DFHXJCO—these must be written in assembler language.

- Must be modified to access the information that CICS passes to them. User-replaceable programs are now passed a communication area (COMMAREA) containing the information they require; in previous releases they were given access to control block fields.

- Must be link-edited as AMODE(31) (including any programs they call).

Reassemble all user-customized error programs (NEPs, TEPs, and PEPs) before they can be migrated.

Table 53 summarizes the changes made to user-replaceable programs.

URM	Purpose	Status	Notes
DFHACEE	Cross system identification program	Obsolete	Use an external security manager (ESM)
DFHDYP	Dynamic routing program	Review	*
DFHPEP	Program error program	Review	*
DFHPGADX	Program autoinstall program	New	*
DFHRTY	Transaction restart program	Obsolete	Use DFHREST instead
DFHTEP	Terminal error program	Changed	Sequential devices only
DFHUAKP	Activity keypoint program	Obsolete	Replaced by global user exit
DFHXJCC and DFHXJCO	Journal open and close programs	Review	Assembler language only
DFHXSE	External security interface program	Obsolete	Use an ESM

Table 53 (Page 1 of 2). Changes made to user-replaceable programs

Table 53 (Page 2 of 2). Changes made to user-replaceable programs			
URM	Purpose	Status	Notes
DFHXSP	External security interface program	Obsolete	Use an ESM
DFHZATDX	Terminal autoinstall program	Review	*
DFHZATDY	APPC connections autoinstall program	New	*
DFHZNEP	Node error program	Review	*

Note: "Review" in the **Status** column means that the user-replaceable program is essentially unchanged but should be checked for macro usage, access to CICS control blocks, and so on.

The recovery programs

The following CICS-supplied versions of the recovery programs are converted to use the command-level API:

- DFHPEP, the program error program (PEP)
- DFHRTY, the transaction restart program (RTY)
- DFHXTEP, the terminal error program (TEP)
- DFHZNEP0, the node error program (NEP).

The user-replaceable prgram DFHUAKP is obsolete and is withdrawn.

Journaling user-replaceable programs

CICS continues to support the journaling replaceable modules DFHXJCC and DFHXJCO. This ensures compatibility with your installation operating procedures for archiving journals. However, the automatic journal archiving facility is now the recommended method for automatically archiving your CICS disk journals.

Like the CICS-supplied recovery programs, DFHXJCO and DFHXJCC are converted to the command-level API. If you are using customized versions of these user-replaceable programs, convert them to use the command-level API, reassemble them, and link-edit them in AMODE(31). Failure to link the journaling modules AMODE(31) causes CICS to terminate abnormally. Furthermore, you can only use a small subset of the API commands with DFHXJCC and DFHXJCO. See the *CICS Customization Guide* for details of the permitted range of commands.

Autoinstall user programs

There are changes to the COMMAREA that CICS passes to autoinstall user programs to support VTAM model support (MTS) available with VTAM 4.2. In earlier releases of CICS, you coded your COMMAREA DSECTs in accordance with descriptions and recommendations supplied in the *Customization Guide*. CICS supplies a predefined COMMAREA in the DFHTCUDS copy member. If you want to use VTAM model terminal definition support, you must recode your autoinstall user programs to incorporate the new COMMAREA defined in DFHTCUDS, then reassemble (or recompile) and link-edit your user program. There is a DFHTCUDS copy member for all of the supported languages, supplied in the VSE/ESA

sublibrary, PRD1.BASE. See the *CICS Customization Guide* for more information about DFHTCUDS.

Dynamic transaction routing user programs

If you are using the dynamic transaction routing facility, and migrating from CICS for VSE/ESA Version 2.3, modify and then reassemble (or recompile) your dynamic transaction routing user program. This is necessary to incorporate the modified communications area (COMMAREA) which is defined in the DFHDYPDS copybook. If your dynamic transaction routing program is based on one of the CICS-supplied sample programs and tests the COMMAREA length, you must change the COMMAREA length (COMLNGTH) from 36 to 216 bytes. The parameter list passed in the COMMAREA also has an extra request field that you can set to specify whether you want CICS to queue the request if no sessions are immediately available. The values set in the return code and error response fields are also extended.

See the *CICS Customization Guide* for details about writing a dynamic transaction routing program.

Migration planning summary

The key points to remember are:

- The CICS user exit mechanisms are changed. Ensure that your user exit programs conform to the standards required, amending and rewriting them as necessary. Exit programs must not rely upon any assumptions about the CICS internal algorithms for user exit handling.

- Planning should take into account the time required to review the documentation of the points at which user exit programs are invoked, and what can be done in user exit programs to control the subsequent processing performed by CICS.

- The parameter list used at the global user exit interface is changed.

- User exits are changed in parts of CICS that are restructured.

- User exits are enabled by the EXEC CICS ENABLE command and by the TBEXITS system initialization parameter (for transaction backout exits only). The system initialization EXITS parameter is withdrawn.

- You can enable exits during a new PLT phase, which is executed during initialization but before recovery.

- You cannot rely on any previous assumptions about the internals of user exit handling. The use of internal exit numbers is not guaranteed, and will cause unpredictable results.

- It is no longer possible to use a return code of 4 from the XGMTEXT user exit. If you have a user exit program at this point, you must check it for the use of this return code, and change your program if necessary.

- Attempting to use CICS services in global user exits other than those in transaction backout, except with the new exit programming interface, causes unpredictable results.

- Observe the restrictions concerning the use of the new exit programming interface (XPI), as described in the *CICS Customization Guide* or your exit programs will have unpredictable results.

- Review all changes made to the GLUE interface.

- Do not use the reserved fields, UEPCSA and UEPTCA, in exit programs.

- All user-replaceable programs must be written to command-level standards, must not access CICS internal control blocks, and must be link-edited AMODE(31).

- Reassemble all NEPs, TEPs, and PEPs. Note that TEPs can be used with sequential devices only in CICS TS Release 1

- The DFHUAKP user-replaceable program is obsolete.

- To use VTAM model terminal definitions, recode your autoinstall user programs to include the new COMMAREA defined in DFHTCUDS.

- If you plan to use the dynamic transaction routing facility, after migrating from CICS for VSE/ESA Version 2.3, modify and reassemble (or recompile) your DTR user programs to incorporate the modified COMMAREA defined in copybook DFHDYPDS. If your DTR program is based on one of the CICS-supplied samples, and tests the COMMAREA length, change the COMMAREA length from 36 bytes to 216 bytes.

Chapter 19. CICS-supplied transactions

This chapter describes the changes made to CICS-supplied transactions.

Obsolete transactions

The following CICS-supplied transactions are obsolete.

Table 54. Obsolete CICS-supplied transactions	
Transaction	**Reason for removal**
CSFR, the field engineering transaction	The error recognition system (FERS) is obsolete
CSMT, the old master terminal transaction	The CEMT transaction is extended **1**
CSOT, the terminal status transaction	The CEOT transaction is extended **1**
CSSF, the sign-off transaction	Replaced by the CESF transaction **2**
CSSN, the sign-on transaction	Replaced by the CESN transaction **3**
CSST, the supervisory terminal transaction	The CEST transaction is extended **1**
CSTT, the statistics transaction	Replaced by the new CEMT PERFORM STATISTICS command

Notes: **1** These transactions are extended so that you can use them with consoles and sequential devices (disk, tape, and card reader/line printer) in addition to terminal devices.

If you need to issue control commands from devices that are not supported in this way, you can use the new EXEC CICS commands to write your own transactions. For more information about these commands, see the *CICS System Programming Reference* manual.

2 See "The signoff transaction, CESF" on page 155 for more information.

3 See "The sign-on transaction, CESN" on page 163 for more information.

New CICS-supplied transactions

The following transactions are new.

The signoff transaction, CESF

Use CESF to sign off from the CICS system. CESF:

- Writes the signoff message to the user's terminal
- Logs the message on the transient data destination, CSCS
- Logs any error message on the transient data destination, CSMT.

If you use CESF to disconnect a terminal and security is active, a message is sent to the log if signoff fails. However, this does not stop the terminal being disconnected if it is a preset terminal, or if the terminal is not signed on.

CESF cannot be used with:

- Fixed-format terminals such as 3608, 3614, and 3653 terminals
- Numeric-only terminals
- IBM 2741 and IBM 3741 devices with magnetic strip readers

For theses types of terminals, write your own signoff transaction using the EXEC CICS SIGNOFF command.

CESF replaces the CSSF signoff transaction, which is obsolete.

The trace transaction, CETR

The CETR transaction controls tracing. It is supplied in addition to the CEMT transaction for trace, which is extended. CEMT INQUIRE and SET commands for trace are changed to allow you to continue specifying the following trace functions through the console:

AUXtrace   Start, stop, pause, and switch the auxiliary trace destination

INttrace   Start and stop internal system trace

The new CETR transaction, which provides much more function than CEMT for controlling all aspects of CICS tracing, is available only through a BMS-supported device. For example, you cannot use CETR from a console, because it requires full-screen support for its BMS maps.

The master terminal transaction, CEMT

The following changes are made to the CEMT transaction.

New CEMT commands

The CEMT commands shown in Table 55 are new.

Table 55 (Page 1 of 3). Summary of new CEMT commands	
Command	**Description**
CEMT INQUIRE AUTINSMODEL	Display information about all installed autoinstall model definitions. The panel CICS returns to your screen allows you to use the DISCARD AUTINSTMODEL function.
CEMT INQUIRE and SET DELETSHIPPED	Display and set system settings for the CICS timeout delete mechanism.
CEMT INQUIRE and SET DSAS	Display and set CICS dynamic storage areas.
CEMT INQUIRE and SET DSNAME	Display and set data set name block information that CICS maintains for each DAM and VSAM data set.
CEMT INQUIRE and SET DUMPDS	Display and set information about CICS dump data sets. Replaces the DUMP command keyword.
INQUIRE and SET EXCI	Display and set information about each batch region connected to CICS.
CEMT INQUIRE and SET commands for FEPI	Includes FECONNECTION, FEPOOL, FEPROPSET, and FETARGET. See the CICS Front End Programming Interface User's Guide for more information.

Table 55 (Page 2 of 3). Summary of new CEMT commands	
Command	**Description**
CEMT INQUIRE and SET INTTRACE	Display and set CICS internal internal trace table information. Replaces the TRACE command keyword, which is accepted as a synonym for INTTRACE on the INQUIRE command.
INQUIRE and SET JOURNALNUM	Display and set information about the system log and user journals profile. Replaces the JOURNAL command keyword.
CEMT INQUIRE and SET MONITOR	Controls CICS monitoring activity.
CEMT INQUIRE PARTNER	Display information about the partner resource table. The panel CICS returns to your screen allows you to use the DISCARD PARTNER function.
CEMT INQUIRE PROFILE	Displays information about all installed profiles. The panel CICS returns to your screen allows you to use the DISCARD PROFILE function. The introduction of this command affects the minimum abbreviation you can use for program definitions. To use CEMT for programs, the minimum abbreviation you can use is PROG and not PR as in CICS for VSE/ESA Version 2.3.
CEMT INQUIRE and SET STATISTICS	Display and set CICS interval statistics times.
CEMT INQUIRE and SET SYDUMPCODE	Display and set system dump settings. You can add, change, and delete entries in the CICS system dump table.
CEMT INQUIRE and SET TDQUEUE	Replaces the QUEUE command keyword. QUEUE is still accepted for the INQUIRE function only, with a warning message: `E  'QUEUE' IS NOT VALID, TDQUEUE HAS BEEN ASSUMED` The SUFFIX option is obsolete.
CEMT INQUIRE and SET TRDUMPCODE	Display and set CICS transaction dump settings. You can add, chang, and delete entries in the CICS transaction dump table.
INQUIRE TSQUEUE	Display and set information about TS queues.
CEMT DISCARD	Discard installed resource definitions, and also the corresponding catalog entries. You can use the DISCARD command against the following resources: • AUTINSMODEL • FILE • PARTNER • PROFILE • PROGRAM • TCLASS • TRANSACTION
CEMT PERFORM DELETSHIPPED	Cause the CICS timeout delete mechanism to be invoked immediately.
CEMT PERFORM DUMP|SNAP	Obtain a CICS system dump.

Table 55 (Page 3 of 3). Summary of new CEMT commands	
Command	**Description**
CEMT PERFORM STATISTICS RECORD	Write statistics for a named resource type immediately to a DMF data set instead of waiting for the current statistics-gathering interval to expire.

Changes to existing CEMT commands

The CEMT commands shown in Table 56 are changed.

Table 56 (Page 1 of 5). Summary of changes to existing CEMT commands	
Command	**Description**
CEMT INQUIRE and SET AUTOINSTALL	The ACTIVE field on the CEMT INQUIRE AUTOINSTALL screen is renamed CURRENT(*value*).
	The SET AUTOINSTALL option MAXIMUM is renamed MAXREQS(*value*).
CEMT SET AUXTRACE	The CEMT SET AUXTRACE command has the following new options:
	• START • STOP • PAUSE • NOSWITCH • NEXT • ALL
	The ON and OFF options are obsolete.
CEMT INQUIRE and SET CONNECTION	The following new fields are displayed on the CEMT INQUIRE CONNECTION screen:
	• OBTAINING (APPC only) • FREEING (APPC only) • AVAILABLE (APPC only) • XOK (APPC only) • XNOTDONE (APPC only) • VTAM • IRC • INDIRECT • EXCI • APPC • LU61
	The following new options are available on the CEMT SET CONNECTION command:
	• CANCEL • FCANCEL
	The PENDING option is obsolete
CEMT INQUIRE and SET DATASET	The CEMT INQUIRE DATASET command is replaced by INQUIRE FILE, but is accepted for compatibility purposes. The SET DATASET command returns an error. You should use the CEMT SET FILE command instead.

Table 56 (Page 2 of 5). Summary of changes to existing CEMT commands	
Command	**Description**
CEMT INQUIRE and SET FILE	The following new fields are displayed on the CEMT INQUIRE FILE panel:
	• ADDABLE • NOADDABLE • CATNAME • DSNAME • MAXNUMRECS • NOTABLE • CICSTABLE • USERTABLE
	The ADD and NOADD fields are replaced by the fields ADDABLE and NOADDABLE
	The following new options are added to the CEMT SET FILE command:
	• ADDABLE • NOADDABLE • MAXNUMRECS • NOTTABLE • CICSTABLE • USERTABLE
CEMT INQUIRE AND SET PROGRAM	The CEMT INQUIRE PROGRAM panel displays the following new fields:
	• NOTDEFINED • PRIVATE • SHARED • NOTREQUIRED • REQUIRED • CEDF • NOCEDF • ANY • BELOW • CEXECKEY • UEXECKEY
	The RPG field is obsolete
	The following new options are available on the CEMT SET PROGRAM command:
	• (*value*) • CLASS(*value*) • ALL • PRIVATE • SHARED • PHASEIN • CEDF and NOCEDF

Table 56 (Page 3 of 5). Summary of changes to existing CEMT commands	
Command	**Description**
CEMT INQUIRE AND SET SYSTEM	The CEMT INQUIRE SYSTEM panel displays the following new fields: • AGING • CDSASIZE • CICSTSLEVEL • CMDPROTECT • DFLTUSER • DSALIMIT • DUMPING • ECDSASIZE • EDSALIMIT • ERDSASIZE • ESDSASIZE • EUDSASIZE • MROBATCH • OPREL • OPSYS • PROGAUTOCTLG • PROGAUTOEXIT • PROGAUTOINST • RDSASIZE • REENTPROTECT • RELEASE • SCANDELAY • SDSASIZE • SOSSTATUS • STOREPROTECT • UDSASIZE The AMAXTASKS, CUSHION, and STALL fields are obsolete. The CEMT SET SYSTEM command has the following new options: • AGING • DSALIMIT • DUMPING • EDSALIMIT • MROBATCH • PROGAUTOCTLG • PROGAUTOEXIT • PROGAUTOINST • SCANDELAY The AMAXTASKS, CUSHION, and STALL options are obsolete.

Table 56 (Page 4 of 5). Summary of changes to existing CEMT commands	
Command	**Description**
CEMT INQUIRE AND SET TASK	The CEMT INQUIRE TASK screen displays the following new fields: • RUNNING • DISPATCHABLE • SUSPENDED • PRIORITY • HTYPE • HVALUE • HTIME • STARTCODE • USERID The ACTIVE and HELD fields are obsolete. The following new options are available on the CEMT SET TASK command: • (*value*) • PRIORITY(*value*) The TCLASS(*clasid*) option is obsolete.
CEMT INQUIRE AND SET TCLASS	The CEMT INQUIRE TCLASS screen displays the following new fields: • MAXACTIVE • ACTIVE • PURGETHRESH • QUEUED The MAXTASKS field is obsolete. The following new options are available on the CEMT SET TCLASS command: • (*value*) • MAXACTIVE(*value*) • PURGETHRESH(*value*) The MAXTASKS(*value*) option is obsolete.
CEMT INQUIRE AND SET TERMINAL	The CANCEL option is new.
CEMT INQUIRE AND SET TRANSACTION	The CEMT INQUIRE TRANSACTION screen displays the following new fields: • PROGRAM • TCLASS • PURGEABLE • NOTPURGEABLE • PRFILE • CDATAKEY • UDATAKEY • ANY • BELOW • TRPROF The following new options are added to the CEMT SET TRANSACTION command: • TCLASS • PURGEABLE|NOTPURGEABLE

Table 56 (Page 5 of 5). Summary of changes to existing CEMT commands	
Command	**Description**
CEMT INQUIRE AND SET VTAM	The CEMT INQUIRE VTAM screen displays the new field PSDINTERVAL for persistent sessions support.
	The PSDINTERVAL option is added to the CEMT SET VTAM command.

For information about all the new and changed CICS-supplied transactions, see the *CICS-Supplied Transactions* manual.

Obsolete CEMT INQUIRE and SET commands

The following CEMT INQUIRE (and SET commands where appropriate) are obsolete:

- CONTROL
- DUMP (superseded by DUMPDS)
- DUMPOPTIONS
- JOURNAL (superseded by JOURNALNUM)
- LINE
- QUEUE (superseded by TDQUEUE)
- TRACE (superseded by INTTRACE)

The master terminal transaction, CEBT

To be consistent with the changes made to the CEMT transaction, the following changes are made to the CEBT transaction.

Table 57. Summary of changes to the CEBT transaction	
Transaction	**Change**
CEBT INQUIRE|SET AUXTRACE	- ON|OFF options for auxiliary trace changed to START|STOP|PAUSE.
	- New automatic switching options for auxiliary trace data sets, NOSWITCH|NEXT|ALL.
CEBT INQUIRE|SET INTTRACE	INTTRACE controls CICS internal tracing to the CICS internal trace table on the XRF alternate CICS region. It replaces the TRACE command keyword.

The resource definition online transaction, CEDA

The CEDA and CEDB transactions are extended to enable you to define additional resources using the CEDA transaction. These are:

- FILE
- LSRPOOL
- PARTNER
- TRANCLASS

See the *CICS Resource Definition Guide* for details of these new resource definition types.

The execution diagnostic facility transaction, CEDF

The restriction is removed that prevented you from using CEDF for transactions defined in a terminal-owning region as remote. See "CEDF restriction removed" on page 195 and the *CICS-Supplied Transactions* manual for more information.

The terminal status transaction, CEOT

\#   The options TTI and NOTTI are added to CEOT as a non-protected field that you
\#   modify in SET mode. The options specify whether the terminal invoking the CEOT
\#   transaction can be used to initiate and run transactions.

The sign-on transaction, CESN

The GROUPID option is added to the CESN transaction. It specifies a user's group ID (up to 8 characters).

Use the CESN transaction to sign on in in place of the CSSN transaction, which is obsolete.

The supervisory terminal transaction, CEST

Changes to the CEST transaction are summarized in Table 58.

Table 58. Summary of changes to the CEST transaction

Transaction	Change
CEST INQUIRE and SET CONTROL	Obsolete.
CEST INQUIRE and SET LINE	Obsolete.
CEST INQUIRE NETNAME	The TRANID option is replaced by the TRANSACTION option. TRANSACTION(*value*) displays a 4-character string indicating the name of the transaction currently being processed with this terminal as its principal facility or as a secondary facility.
CEST INQUIRE and SET TASK	The following new options are added to the CEST INQUIRE TASK command: • RUNNING • DISPATCHABLE • SUSPENDED • HTYPE(*value*) • HVALUE(*value*) • HTIME(*value*) • STARTCODE • USERID(*value*) The following changes are made to the CEST SET TASK command: • (*value*)— The CICS-generated task number is in the range 1-99999. • PRIORITY— specifies the priority of the task, in the range 0-255. 255 is the highest priority. The TCLASS option is obsolete.
CEST SET TERMINAL	The CANCEL option is new on the CEST SET TERMINAL command.

The field engineering transaction, CSFE

Table 59 summarizes changes made to the field engineering transaction, CSFE.

Table 59. Summary of changes to the CSFE transaction	
Transaction	**Change**
CSFE	• The DIA, FETRACE, SYSTRACE and USERTRACE options are obsolete.
	• For the storage violation trap, the FAQE chain-checking mechanism of the CSFE DEBUG transaction is obsolete. The options ON, OFF, SUBPOOL, ALL, CONTROL, TP, TASK, SHARED, and RPL are not supported.
	• The following new options are added to the CSFE DEBUG transaction:

	– CHKSTSK={ALL|CURRENT|NONE}
	   – CHKSTRM={CURRENT|NONE}
	   – GTRAP, indicates whether the global kernel exit routine is to be activated or deactivated (ON or OFF). On each domain call and return, the kernel invokes the global kernel exit routine, if it is activated.

Migration planning summary

The key points to remember are:

- Instead of the CSMT, CSOT, and CSST transactions, use CEMT, CEOT, and CEST, respectively.

- Instead of the CSTT transaction, use the equivalent CEMT extensions.

- Check the changes made to CEMT and CEBT. These changes are summarized in this chapter, but for full details, see the *CICS-Supplied Transactions* manual.

- You may need to write transactions using the EXEC CICS commands to issue control transactions from any devices that are not supported by the CExx transactions.

- Check and modify any programs that use DFHEMTA or DFHEMTP (the programmable interface to the master terminal program) to issue commands to control CICS tracing. There are two destinations to which CICS can write trace entries:

  - The CICS internal trace table above 16MB
  - The CICS auxiliary trace data sets

  You can continue to use CEMT to control these destinations, or you can use the new CICS-supplied transaction, CETR.

- Note the change to the way you log off from a sequential device. Check any data stream input from such devices, and change any CSSF GOODNIGHT\ command to CESF LOGOFF\.

Table 60. Security road map	
If you want to...	**Refer to...**
See a brief description of the new security domains	"Changes to resource definition" on page 168
Know about the general changes to resource definition for security	"Changes to resource definition" on page 168
Evaluate the changes made to transaction security	"Changes to transaction security" on page 168
Know how to uniquely identify individual system users to CICS	"Terminal user security" on page 171
Know about the obsolete operands affecting preset terminal security	"Preset terminal security" on page 171
Evaluate the changes made to sign-on procedures	"Changes to signon procedures" on page 172
Know about the new CICS default user function	"The CICS default user" on page 173
Know how obsolete operands affect APPC (LU6.2) session security	"APPC (LU6.2) session security" on page 174
Know how changes to MRO bind and link security will affect you	"Multiregion (MRO) security (not supported by the BSM)" on page 175
Know about the new resource security checking function	"Resource security checking (not supported by the BSM)" on page 176
Know about the new command security checking function	"Command security checking (not supported by the BSM)" on page 180
Know about the extensions made to the security migration aid	"Security migration aid" on page 183.
Know about security changes affecting console operators	"Changes affecting console operators (not supported by the BSM)" on page 184
Look at a summary of obsolete security functions	"Summary of obsolete function for security" on page 185
Look at the changes made to report security for the report controller	"Report security" on page 189
Look at the changes made to printer security for the report controller	"Printer security" on page 189
Learn about the new XRF sign-on retention facility	"XRF sign-on retention" on page 191
Know more about overseer compatibility	"Overseer program compatibility" on page 192

Chapter 20. CICS security

CICS internal security is withdrawn, and security in CICS is now provided through the services of an external security manager (ESM) that conforms to the system authorization facility (SAF) interface.

To provide the necessary security for CICS resources, CICS issues RACROUTE calls via the VSE/ESA Version 2 Release 4 SAF interface to route authorization requests to an ESM at appropriate points within CICS transaction processing. Note that if security is active, CICS issues security calls for all terminal users, including those that are not signed on. See "The CICS default user" on page 173 for information about the CICS default user ID, which provides security attributes for users that do not sign on.

You can choose between two levels of external security manager:

- The basic security manager (BSM) provided with the VSE/ESA 2.4 system package. The BSM is a limited-function ESM, and provides sign-on and transaction attach security only. User IDs and operator data previously defined in the CICS signon table (DFHSNT) are defined to the BSM using the VSE/ESA Interactive Interface (II).

- A full-function ESM, provided by an independent software vendor (ISV), that conforms to the SAF interface, and which provides support for all the various security checks issued by CICS.

It is important to secure your system. Using an ESM protects your application programs and CICS system components from misuse (accidental or deliberate). CICS provides a variety of security and control mechanisms that limit the activities of CICS terminal users to only those functions that any particular individual is authorized to access.

Also protect the following resources that CICS does not itself protect:

- A CICS region's own assets, such as program libraries and CICS applids defined in the CICS startup JCL, from unauthorized access.

- Data sets and databases used by CICS, and by CICS application programs. These must be accessible to approved batch processing operations and authorized CICS regions only.

- Systems from application programs that use undocumented or unsupported interfaces to bypass CICS security.

- Application program source libraries.

The security domains

CICS internal security is replaced by two security domains. These domains incorporate the following new features:

- Control of multiple sign-ons by the same user
- Improvements to security messages
- Warnings when a password is about to expire
- Changes to terminal timeout
- Surrogate user checking

The two domains are:

The user (US) domain The user domain provides all the facilities required for checking a user's authority to sign-on at a CICS terminal.

The security (XS) domain The security domain manages the security capabilities of users and handles all the interfaces to the ESM. All interfaces to security services (for example, DFHSEC) are replaced with calls to the XS domain.

4
4
4
Note: A vendor-supplied ESM, and not the BSM provided with VSE/ESA Version 2 Release 4, is required to take full advantage of all the new CICS security features.

Changes to resource definition

If you are using CICS internal security on CICS for VSE/ESA Version 2.3, check the security attributes on resource definitions, and define the required authorizations in your security database in place of the CICS internal resource security keys.

When you upgrade your CSD, the security keywords on all the CICS-supplied resource definitions in DFH-prefixed groups are updated.

User-defined resource definitions

After you have upgraded the CICS-supplied definitions in your CSD, ensure that you upgrade any that you have copied and modified. Do this by deleting the modified CICS groups from your group list, and replace them with upgraded versions. Also, review the security attributes in your own resource definitions. If you have any applications that use the obsolete CICS internal security, redefine these security requirements to an ESM.

5 Vendor and in-house products

5
5
You need to change any in-house or vendor products that use the undocumented DFHSEC macro to interface to CICS security facilities. EXEC CICS SIGNON and SIGNOFF, and EXEC CICS QUERY SECURITY, commands provide the only supported application programming interface for security purposes.

There are no XPI calls for security-related customization through global user exits.

Changes to transaction security

CICS introduces transaction-attach security for non-terminal transactions. When transaction security is active (with system initialization parameters SEC=YES and XTRAN=YES|*classname* specified), CICS always checks the authority of a user ID when attaching a transaction, even when the transaction is not associated with a terminal. This applies to:

- Transactions started when intrapartition transient data queues reach a trigger level
- Program list table (PLT) programs at startup
- Transactions started by an EXEC CICS START command

- System tasks that CICS creates when attaching its category 1 transactions (see below).

Transaction categories for security checking and authorization

CICS-supplied transactions are classified into three categories for the purpose of security checking and authorization:

Category 1   CICS internal-use-only transactions that cannot be invoked from a terminal, and only the CICS region userid should be authorized to use.

Category 2   CICS transactions that are supplied for initiation by a terminal user, or that are associated with a terminal. These are transactions to which only authorized users should have access.

Category 3   CICS transactions to which all users need access without having to sign-on. These transactions are exempt from security checks, and everyone can use them.

See the *CICS Security Guide* for details of all these transactions.

Category 1 transactions

With the system initialization parameters SEC=YES and XTRAN=YES|*classname* specified, CICS issues a security check against its own region user ID for all category 1 transactions early during initialization. Ensure that the user IDs under which you run your CICS regions are authorized to all these transactions that CICS attaches as system tasks, otherwise system initialization fails.

Started transactions

You can specify a user ID explicitly for transactions started by an EXEC CICS START command, where the command does not also specify a terminal (a non-terminal transaction). This allows CICS to perform a transaction-attach security check, and, for users of full-function ESMs only, resource and command security checks, at execution time. A default mechanism is available. Transactions started by the EXEC CICS START TRANSID command (without specifying a TERMID or USERID) inherit the user ID associated with the initiating transaction.

The inherited user ID must be authorized to attach the started transaction. This means authorizing user IDs to *attach* started transactions, when previously they needed only authorization to issue the *start command* for the transaction (in the XPCT class).

\#   Alternatively, you can customize the SAF interface so that the transaction-attach
\#   check is always successful for non-terminal transactions, as in earlier releases.
\#   See the *CICS Customization Guide* for information about customization.

Trigger-level transactions

If you migrate existing destination control tables that do not specify a user ID for trigger-level transactions, CICS issues the transaction-attach security check against the CICS default user ID.

Program list table (PLT) programs at startup

You can specify a user ID for programs that are defined in a post-initialization program list table (PLTPI). These programs run under a new CICS-supplied transaction, CPLT, whose user ID is specified in the new system initialization parameter, PLTPIUSR.

Surrogate user checking (not supported by the BSM)

To control non-terminal security, and the use of the CEDA INSTALL command for the installation of terminals with a preset user ID, CICS uses the surrogate user checking facility provided by an ESM (if it supports one).

CICS uses the surrogate user facility to verify the authority of one user (the surrogate user) to submit a transaction, or install a preset terminal, on behalf of another user.

CICS performs surrogate user checks for:

- Non-terminal started transactions (that is, transactions initiated by an EXEC CICS START command without an associated terminal).

- The installation, during CICS initialization, of DCT entries for transactions initiated by a trigger level that do not have an associated terminal. A surrogate check is also performed if a user ID is dynamically set for a trigger-level DCT entry.

- The installation of program list tables at CICS initialization (PLTPI tables).

- The installation of terminals and sessions with preset security using the CEDA INSTALL or EXEC CICS CREATE commands.

You do not have to use surrogate user security checks, but if you do, ensure that the surrogate user profiles are defined for the appropriate user IDs. You enable surrogate user checking for non-terminal transactions, and for program list tables at initialization, by specifying XUSER=YES as a system initialization parameter. To inhibit surrogate user checking, specify XUSER=NO, which is the default.

The user IDs that must be authorized as surrogate users are:

CICS region user IDs
The CICS region user ID must be authorized as a surrogate user of the following user IDs:

- All the user IDs specified on USERID parameters on DFHDCT TYPE=INITIAL and TYPE=INTRA macros for trigger-level transactions

- The CICS default user ID for trigger-level transactions that do not specify a user ID

- The user ID specified on the PLTPIUSR system initialization parameter.

User IDs of transactions that initiate START commands
Any user that runs a transaction that issues an EXEC CICS START command, without an associated terminal, must be authorized as a surrogate of the user ID specified on the START command.

User IDs of transactions that specify ATIUSERIDs
Any user of a transaction that issues an EXEC CICS SET TDQUEUE command
to set a user ID for DCT trigger-level transactions must be authorized as a
surrogate of the user ID specified on the ATIUSERID parameter.

User IDs of users of some CEDA INSTALL commands
Any user that uses the CEDA INSTALL command to install terminals or
sessions defined with a preset security user ID must be authorized as a
surrogate of the preset user IDs specified on the TERMINAL or SESSIONS
definitions.

Achieving compatibility with earlier versions

Because of the extent of the changes, you might need time to migrate gradually to
the new security facilities offered by surrogate user checking. One option is to set
up your security in a way that achieves compatibility with earlier versions. You can
do this by defining suitable generic *userid*.DFHINSTL and *userid*.DFHSTART
profiles in the ESM SURROGAT general resource class.

For example:

- Initially, you can ensure that all surrogate checks succeed on START
  commands by defining a profile for *.DFHSTART with UACC(READ), and
  progressively build profiles for specific users as required.

- You can ensure that nobody, unless properly authorized, can install terminals
  with preset security, by defining a profile for *.DFHINSTL with UACC(NONE).

Terminal user security

To protect resources from unauthorized access, CICS needs to be able to identify
individual system users. You do this by defining your users to the VSE Interactive
Interface (II).

Users identify themselves to CICS by specifying their user identification (user ID),
and the associated password, or OIDCARD (operator identification card), using the
CICS-supplied sign-on transaction, CESN, or through the VSE/ESA II.

When a user signs on, CICS asks the ESM to authenticate the user by checking
the user ID and password in its database. If the request to sign-on is valid, the
ESM creates an accessor environment element (ACEE) for the user, and returns
the address of the ACEE to CICS. Whenever CICS needs to determine if the
signed-on user is authorized to perform a specific function, CICS passes this
address as part of the request to the ESM.

Preset terminal security

With the OPERRSL and OPERSEC parameters on the TERMINAL and SESSIONS
definition now obsolete, preset terminal security is provided by the USERID
parameter on the TERMINAL and SESSIONS resource definitions. During CICS
initialization (for dedicated terminals or during autoinstall processing) CICS issues a
sign-on request for the user ID specified on the USERID parameter. Thus the
terminal or session acquires the security defined for the specified user ID.

Changes to signon procedures

There are changes to the CICS signon and security facilities that affect the tasks of terminal operators and system programmers. Update your operating procedures, and possibly your installation programming standards, to take these changes into account.

The process of signing on to, and signing off from, a CICS region is changed. You sign on and sign off using the new CESN and CESF transactions, instead of the CSSN and CSSF transactions, which are obsolete. The CESN and CESF transactions support more devices, but they do not include numeric-only terminals, or IBM 2741 and IBM 3741 devices with magnetic strip readers.

Note: Although CSSF is obsolete as a signoff transaction at a user terminal, it is supported for use by old applications that issue EXEC CICS START CSSF commands.

One effect of removing CSSN is that operators need to sign on with an 8-character user ID, rather than with the 20-character operator name that could previously be used with CSSN.

The CESN transaction, which invokes a new DFHSNP program, is a pseudo-conversational transaction. DFHSNP conforms to the command-level application programming interface. Its source is no longer supplied in the VSE/ESA sublibrary, PRD1.BASE. The assembler code is available only on the optional source tape.

The syntax of the CESN sign-on command is as follows:

```
CESN [USERID=userid]
     [,PS=password]
     [,NEWPS=password]
     [,LANGUAGE=language-code]
     [,GROUPID=99999999]  1
```

Note: **1** The GROUPID keyword is only meaningful when you use an ESM. It does not apply to the BSM supplied by VSE.

If you enter only the transaction name "CESN" on a device that uses the IBM 3270 data stream, CICS displays a sign-on screen for you to enter your user ID and other data.

If you enter only the transaction name "CESN" on a device that does not use the IBM 3270 data stream, CICS prompts you to enter the required data.

The CESN transaction can be specified on a system initialization parameter as the "good morning transaction" (GMTRAN=CESN) so that it is started automatically without the operator having to invoke it.

You sign off by entering 'CESF' or 'CESF GOODNIGHT'. Entering the command 'CESF LOGOFF' causes CICS to sign off the user ID and then log off the terminal from VTAM.

Obtaining CICS-related data at signon

When handling an explicit signon by a CICS terminal user, CICS obtains the CICS segment terminal user attributes by calling the ESM to request data about the CICS terminal user from the CICS segment and the LANGUAGE segment. If the CICS segment or the LANGUAGE segment data are present for the terminal user, the ESM returns this data to CICS.

If the ESM does not return the CICS segment or LANGUAGE segment data for the user, CICS uses the user attributes of the CICS default user. This user ID is specified on the DFLTUSER system initialization parameter.

CICS obtains the national language attribute in the following order:

1. The LANGUAGE option on the CICS-supplied CESN transaction, or the LANGUAGECODE or NATLANG option of the EXEC CICS SIGNON command.

   A supported national language is a valid national language that has been specified in the NATLANG system initialization parameter and has the corresponding message definitions. See the *CICS System Definition Guide* for more information about defining the NATLANG parameter.

2. The PRIMARY(primary-language) parameter in the LANGUAGE segment of the user's ESM profile, if supported by CICS.

3. The SECONDARY(secondary-language) parameter in the LANGUAGE segment of the user's ESM profile, if supported by CICS.

4. The NATLANG parameter in the CSD definition of the user's terminal (for preset terminal security).

5. The language established for the default user.

The CICS default user

CICS uses the security attributes of the default user ID to perform all the security checks for any terminal users that do not sign-on using the CESN sign-on transaction. These security checks apply to transaction-attach security checking, and to resource and command security checking (not supported by the BSM).

Define a CICS default user ID to your security manager. When you have done this, specify the default user ID to CICS on the DFLTUSER system initialization parameter. CICS "signs on" the default user during system initialization. If you specify SEC=YES as a system initialization parameter, and CICS cannot sign-on the default user ID specified on the system initialization parameter, initialization is terminated with an error message.

The resource access authorizations that you give to the default user should be limited to those resources that are to be made universally available, and are not restricted to specific users only. For example, on a development system where programmers need access to the CECI and CEDF transactions while developing their programs, you might create a default user ID that gives access to these transactions.

On a production system, however, the default user should not have access to any of the CICS-supplied transactions that are subject to security checking.

If a task is started without an associated user ID, it is assigned the default user ID as specified on the DFLTUSR system initialization parameter. Generally, a task associated with the default user ID should have very limited authority.

Some resources now have additional keywords. For example, the destination control table (DCT) has a new USERID parameter that is used for trigger-level transactions not associated with a terminal.

Obtaining CICS-related data for the default user

When implicitly signing on the CICS default user during initialization, CICS obtains the attributes for the default user by calling the ESM to request user data for the CICS default user from the CICS segment and the LANGUAGE segment. If the CICS segment or the LANGUAGE segment data are present for the default userid, the ESM returns the segment data to CICS.

If the ESM does not return the CICS segment or LANGUAGE segment data for the default userid, CICS assigns the following built-in system default values:

National language Obtained from the first operand on the NATLANG system initialization parameter. This defaults to US English if not specified.
Operator class One (OPCLASS=1)
Operator identification Blank (OPIDENT='   ')
Operator priority Zero (OPPRTY=0)
Timeout Zero (TIMEOUT=0)
XRF signoff Signoff not forced (XRFSOFF=NOFORCE)

APPC (LU6.2) session security

The method you use for bind security on LU6.2 connections depends on the capabilities of your ESM:

- If your ESM supports bind-time session security, you can use the facilities provided by the APPCLU general resource class, and specify XAPPC=YES as a system initialization parameter. Defining BINDSECURITY=YES on the CONNECTION resource definition indicates that you want bind-time security checking on the connection, using the ESM's facilities. In this case, any BINDPASSWORD defined on the CONNECTION definition is ignored.

- If your ESM does not support bind-time security (for example, the BSM) you can continue to use the BINDPASSWORD option on the CONNECTION resource definition to implement bind-time security. To do this, specify:

  – XAPPC=NO as a system initialization parameter and
  – BINDSECURITY=NO on the CONNECTION resource definition

  and CICS uses the BINDPASSWORD.

See the *CICS Security Guide* for information about LU6.2 bind security using APPCLU profiles.

Multiregion (MRO) security (not supported by the BSM)

There are changes that affect two areas of MRO security:

- MRO bind security
- MRO link security

Changes to MRO bind security

The SECURITYNAME parameter is no longer used for MRO bind-time security checking, nor is it used for any other security purpose on MRO links. The old CICS internal bind-time security mechanisms are replaced by calls to an ESM using the VSE SAF interface.

The CICS interregion communication program also uses the ESM to check that CICS regions logging on to IRC are the regions they claim to be.

This change to MRO logon and bind-time security also applies to earlier releases of CICS that use the CICS TS Release 1 interregion communication program, DFHIRP. When you install the latest DFHIRP in the SVA, the ESM is used for bind security on all releases of CICS, even if no CICS TS Release 1 regions are active in the VSE image. To support the MRO security checking performed by the new DFHIRP, ensure the region user ID of each CICS for VSE/ESA Version 2.3 region is correctly defined to the ESM.

Changes to MRO link security

The SECURITYNAME parameter is obsolete for MRO connections. The primary method for specifying the user ID to be used for link security is the USERID parameter on an MRO SESSIONS definition.

To establish whether an MRO connection is subject to link security checking, or whether it is to be bypassed, CICS compares its own region user ID with the link user ID of its partner specified on the SESSIONS definition:

- If the user IDs are the same, link security checking is bypassed.

- If they are different, CICS "signs on" on the link user ID specified on the SESSIONS definition, and uses this on all link security checks.

The default link user ID

If you do not specify a link security user ID on the SESSIONS definition, CICS uses the region user ID of its partner as the default link user ID. To establish whether an MRO connection is subject to link security or whether it is to be bypassed, CICS compares its partner's region user ID with its own region user ID:

- If the user IDs are the same, link security checking is bypassed.

- If they are different, CICS "signs on" on its partner's region user ID as the link user ID and uses this for all link security checks.

When link security checking is bypassed, security checking is determined by the ATTACHSEC parameter on the CONNECTION resource definition, as shown in Table 61 on page 176.

Table 61. MRO Security Options		
Link Security	**ATTACHSEC**	
	LOCAL	**IDENTIFY**
Yes	CICS ignores the user ID associated with the transaction, and issues all security checks against the link user ID only.	CICS issues two security checks: 1. Against the user ID associated with the transaction 2. Against the link user ID, ensuring that the transaction cannot access resources not authorized for the link.
Bypassed	CICS issues all security checks against the CICS default user ID (the user ID specified on the DFLTUSER system initialization parameter)	CICS issues security checks against the user ID associated with the transaction.

The APPL profile name for terminal-owning regions

All connected MRO regions pass the APPL profile name received from the local CICS region to which the terminal user is signed on—the terminal-owning region—to the ESM. Thus users authorized to the APPL profile of the terminal-owning region to which they sign-on are automatically authorized to all the MRO-connected regions in a CICSplex[5]

This does not apply to transaction routing or to function shipping requests that are passed over APPC links (that is LU6.2 links).

Resource security checking (not supported by the BSM)

"Changes to transaction security" on page 168 describes how to control access to CICS transactions using transaction-attach security. This section describes how you can implement a further level of security by controlling access to the resources used by the CICS transactions. Thus, although a user may be authorized to invoke a particular CICS transaction, the user may not be authorized to access files or other general resources used within the transaction. Unlike transaction-attach security, which you cannot control by transaction, you can control resource security checking at the individual transaction level.

Resources defined to CICS to support application programs are also subject to security checking if resource or command security checking (see "Command security checking (not supported by the BSM)") is specified.

You control who has access to the general resources used by CICS transactions by specifying:

- SEC=YES as a system initialization parameter
- RESSEC=ALWAYS as a system initialization parameter

---

[5] A CICS complex. A CICSplex consists of two or more regions that are linked using CICS intercommunication facilities. See the *CICS Glossary*.

- RESSEC(YES) in the TRANSACTION resource definition

  Note: RESSEC is called RSLC in previous releases of CICS.
  RSLC(EXTERNAL) can be specified in compatibility mode only.

- The types of resource you want to protect by defining CICS system initialization parameters for the ESM general resource classes

- The CICS resources to the ESM in resource class profiles, with appropriate access lists.

These resources are described briefly in Table 62, with the associated CICS system initialization parameter that you use to specify the ESM class names.

Table 62 (Page 1 of 3). General resource checking by CICS	
System initialization parameter	**Resource protected**
XAPPC	Partner logical units (LU6.2).
XCMD [1]	The subset of CICS application programming commands that are subject to command security checking. EXEC CICS FEPI system commands are also controlled by this parameter.
	For XCMD=YES, the default resource class name is CCICSCMD, and the default grouping class name is VCICSCMD.
	If you choose your own name (XCMD=name), Cname is the resource class name and Vname is the grouping class name.
XDCT [1]	CICS extrapartition and intrapartition transient data queues. Define profiles in the destination class to control who is allowed to access CICS transient data queues.
	For XDCT=YES, the default resource class name is DCICSDCT, and the default grouping class name is ECICSDCT.
	If you choose your own name (XDCT=name), Dname is the resource class name and Ename is the grouping class name.
XFCT [1]	CICS file-control-managed VSAM and DAM files. Define profiles in the file class to control who is allowed to access CICS VSAM and DAM files.
	For XFCT=YES, the default resource class name is FCICSFCT, and the default grouping class name is HCICSFCT.
	If you choose your own name (XFCT=name), Fname is the resource class name and Hname is the grouping class name.

Table 62 (Page 2 of 3). General resource checking by CICS	
System initialization parameter	**Resource protected**
XJCT **1**	CICS system log and journals. Define profiles in the journal class to control who is allowed to access CICS journals.
	For XJCT=YES, the default resource class name is JCICSJCT, and the default grouping class name is KCICSJCT.
	If you choose your own name (XJCT=name), Jname is the resource class name and Kname is the grouping class name.
XPCT **1**	CICS started transactions and the following EXEC CICS commands:
	COLLECT STATISTICS TRANSACTION CREATE TRANSACTION DISCARD TRANSACTION INQUIRE TRANSACTION INQUIRE REQID SET TRANSACTION CANCEL
	Define profiles in the started-transactions class to control who is allowed access to started CICS transactions.
	For XPCT=YES, the default resource class name is ACICSPCT, and the default grouping class name is BCICSPCT.
	If you choose your own name (XPCT=name), Aname is the resource class name and Bname is the grouping class name.
XPPT **1**	CICS application programs. Define profiles in the program class to control who is allowed to access CICS application programs that a CICS application invokes by means of a LINK, XCTL, or LOAD command.
	For XPPT=YES, the default resource class name is NCICSPPT, and the default grouping class name is MCICSPPT.
	If you choose your own name (XPPT=name), Mname is the resource class name and Nname is the grouping class name.
XPSB **1**	DL/I program specification blocks (PSBs). Define profiles in the PSB class to control who is allowed to access the DL/I PSBs used in CICS application programs.
	For XPSB=YES, the default resource class name is PCICSPSB, and the default grouping class name is QCICSPSB.
	If you choose your own name (XPSB=name), Pname is the resource class name and Qname is the grouping class name.
XTRAN	CICS transactions.

Table 62 (Page 3 of 3). General resource checking by CICS	
System initialization parameter	**Resource protected**
XTST **1**	CICS temporary storage destinations. Define profiles in the temporary storage class to control who is allowed to access CICS temporary storage queues.
	For XTST=YES, the default resource class name is SCICSTST, and the default grouping class name is UCICSTST.
	If you choose your own name (XTST=name), Sname is the resource class name and Uname is the grouping class name.
XUSER	Surrogate user security.
Note: **1** The default class names on the CICS security-related system initialization parameters are the default names supported by the ESM. If you don't want to use these general resource class names, you can specify your own resource class names, except for the first letter. The first letter must be the same as that in the default class names. See see "New system initialization parameters" on page 68 and "Changed system initialization parameters" on page 75 for more information about system initialization parameters.	

Note: No authorization processing is done for BMS commands.

RESSEC keyword on the TRANSACTION resource definition

Specifying RESSEC(YES) in the definition for a transaction together with the appropriate resource classes defined in the system initialization parameters provides security checking in addition to transaction-attach security.

For most simple (or single-function) transactions, this extra security should not be necessary. If you have complex or multiple-function transactions that offer users a choice of functions, or you are unsure about all the options available within a transaction, you may need this capability to restrict access to the data as well as to the transaction.

Before implementing resource security checking, consider the extra overhead that resource security checking involves, and only implement it if you believe the additional security is necssary.

The RESSEC system initialization parameter

You can force RESSEC=YES for all CICS transactions by specifying ALWAYS on the RESSEC system initialization parameter. However, this is not recommended because:

- For most transactions, simply controlling access to the transaction is enough to control everything that the transaction can do.

- Invoking a resource check for every CICS resource results in extra overhead that reduces the performance of all transactions.

- Some CICS-supplied transactions may access resources of which you are unaware. It is your responsibility to ensure that users of these transactions are given enough authority to allow the transactions to continue to work.

Effects of security checking on CICS performance

A slight reduction in pathlength of a security resource check might be expected due to the removal of some interface layers.

Improvements in the amount of time taken to sign-on the user IDs specified on the SECURITYNAME parameter for CONNECTIONS (link security user IDs) can be expected. This is because all such sign-ons for the same user ID are shared; that is, only one invocation of RACROUTE REQUEST=VERIFY is performed.

Resource security checking for DPL commands

CICS does not perform the security check in the case of a distributed program link (DPL) command, even when program resource checking is active. If CICS finds that a program referenced on an EXEC CICS LINK command is a remote program, it does not perform the security check in the local region. The security check is performed only in the CICS region in which the linked-to program executes.

For example, if CICSA function ships a DPL command to CICSB, where the program then executes, CICSB issues the security check. If the DPL request is function shipped again to CICSC for execution, it is CICSC that issues the security check for MRO link security.

Command security checking (not supported by the BSM)

You can use CICS command security to check system programming interface (SPI) commands issued from CICS application programs, and the equivalent commands that can be issued from CEMT commands. Command security operates in addition to any transaction or resource security that may already have been defined for a transaction. The commands that are subject to command security checking are all those commands that require the SP translator option, as follows:

- ACQUIRE
- COLLECT
- CREATE
- DISABLE and ENABLE
- DISCARD
- EXTRACT EXIT
- INQUIRE
- PERFORM
- RESYNC
- SET.

The resources subject to command security checking are shown in Table 63.

Table 63 (Page 1 of 3). Resources subject to command security checking	
Resource name	**Related CICS commands**
AUTINSTMODEL	EXEC CICS, CEMT INQUIRE, and DISCARD AUTINSTMODEL
AUTOINSTALL	EXEC CICS and CEMT INQUIRE|SET AUTOINSTALL
CONNECTION	EXEC CICS and CEMT INQUIRE|SET CONNECTION and EXEC CICS CREATE CONNECTION
DSNAME	EXEC CICS and CEMT INQUIRE|SET DSNAME

Table 63 (Page 2 of 3). Resources subject to command security checking

Resource name	Related CICS commands
DUMP	EXEC CICS PERFORM DUMP and CEMT PERFORM SNAP
DUMPDS	EXEC CICS and CEMT INQUIRE|SET DUMPDS
EXCI	CEMT INQUIRE|SET EXCI
EXITPROGRAM	EXEC CICS ENABLE PROGRAM EXEC CICS DISABLE PROGRAM EXEC CICS EXTRACT EXIT EXEC CICS RESYNC ENTRYNAME
FEPIRESOURCE	Some EXEC CICS FEPI commands
FILE	EXEC CICS, CEMT INQUIRE|SET, and DISCARD FILE and EXEC CICS CREATE FILE
IRC	EXEC CICS and CEMT INQUIRE|SET IRC
JOURNALNUM	EXEC CICS and CEMT INQUIRE|SET JOURNALNUM
LINE	CEMT INQUIRE|SET LINE
LSRPOOL	EXEC CICS CREATE LSRPOOL
MAPSET	EXEC CICS CREATE MAPSET
MODENAME	EXEC CICS and CEMT INQUIRE|SET MODENAME
MONITOR	EXEC CICS and CEMT INQUIRE|SET MONITOR
PARTITIONSET	EXEC CICS CREATE PARTITIONSET
PARTNER	EXEC CICS, CEMT INQUIRE, and DISCARD PARTNER, and EXEC CICS CREATE PARTNER
PROFILE	EXEC CICS, CEMT INQUIRE, and DISCARD PROFILE, and EXEC CICS CREATE PROFILE
PROGRAM	EXEC CICS and CEMT INQUIRE|SET, and DISCARD PROGRAM, and EXEC CICS CREATE PROGRAM
RECONNECT	CEMT PERFORM RECONNECT
REQID	EXEC CICS INQUIRE|SET REQID
RESETTIME	EXEC CICS and CEMT PERFORM RESETTIME
SECURITY	EXEC CICS and CEMT PERFORM SECURITY REBUILD
SESSIONS	EXEC CICS CREATE SESSIONS
SHUTDOWN	EXEC CICS and CEMT PERFORM SHUTDOWN
STATISTICS	EXEC CICS, CEMT INQUIRE|SET STATISTICS, COLLECT STATISTICS, and PERFORM STATISTICS RECORD
STORAGE	EXEC CICS and CEMT INQUIRE STORAGE
SYSDUMPCODE	EXEC CICS and CEMT INQUIRE|SET SYSDUMPCODE
SYSTEM	EXEC CICS and CEMT INQUIRE|SET SYSTEM
TASK	EXEC CICS and CEMT INQUIRE|SET TASK and TASKLIST
TCLASS or TRANCLASS	EXEC CICS and CEMT INQUIRE|SET TCLASS or EXEC CICS and CEMT INQUIRE|SET TRANCLASS, and EXEC CICS CREATE TRANCLASS, and EXEC CICS DISCARD TRANCLASS

Table 63 (Page 3 of 3). Resources subject to command security checking	
Resource name	**Related CICS commands**
TDQUEUE	EXEC CICS and CEMT INQUIRE|SET TDQUEUE
TERMINAL	EXEC CICS and CEMT INQUIRE|SET TERMINAL and NETNAME and EXEC CICS CREATE TERMINAL
TRACEDEST	EXEC CICS and CEMT INQUIRE|SET TRACEDEST
TRACEFLAG	EXEC CICS INQUIRE|SET TRACEFLAG
TRACETYPE	EXEC CICS INQUIRE|SET TRACETYPE
TRANDUMPCODE	EXEC CICS and CEMT INQUIRE|SET TRANDUMPCODE
TRANSACTION	EXEC CICS, CEMT INQUIRE|SET, and DISCARD TRANSACTION and EXEC CICS CREATE TRANSACTION
TSQUEUE	EXEC CICS and CEMT INQUIRE TSQUEUE
TYPETERM	EXEC CICS CREATE TYPETERM
VTAM	EXEC CICS and CEMT INQUIRE|SET VTAM

You request command security checking by specifying the CMDSEC option on the TRANSACTION resource definition. For each of the SPI commands, it is the resource on which the command operates that you name in the resource classs profile, and to which the user is authorized, and not the command itself.

When running CICS with command security checking, CICS calls the ESM to check whether a terminal user is authorized to use a command that operates on specific resources. In this context, the resource is the object specified on the CREATE, INQUIRE, SET, PERFORM, or COLLECT command (for example, FILE, PROGRAM, TRANSACTION and so on), and not the 8-byte DFHEI*xxx* module name, as is the case in CICS for VSE/ESA Version 2.3.

CICS raises a NOTAUTH condition if a user is not authorized for the resource associated with the command, or if the resource identifier is not defined to your ESM.

Note: Command security checking is not supported by the basic ESM available as part of the VSE/ESA Version 2 Release 2 system package. It is only available with a full-function ESM.

4   For details of CICS command security see the *CICS Security Guide*

Distinguishing between READ, UPDATE, and ALTER intent

If you specify SEC=YES as a system initialization parameter, CICS requires an access level appropriate to the access intent associated with the command; see Table 64 on page 183 for details. To use this facility, ensure that your ESM can distinguish between READ, UPDATE, and ALTER access intent. The default on the SEC system initialization parameter is YES.

If you run CICS with SEC=YES, define the appropriate access levels for all users of transactions that issue SP-type commands. The access levels required for the command types are shown in Table 64 on page 183.

Table 64. Required authorizations for CICS command types	
Permitted access	**Command types**
READ access	INQUIRE and COLLECT
UPDATE access	SET, PERFORM, DISCARD, ENABLE, DISABLE, EXTRACT and RESYNC
ALTER access	CREATE

Using command and resource security together

If you specify both command and resource security checking, CICS issues two calls to the ESM for each command, the first to check the command, and the second to check the user's access to the resource on which the command operates. For example, if you specify both command and resource security on a transaction that issues the command:

```
EXEC CICS SET FILE('FILEA') OPENSTATUS(18)
```

CICS first issues a call to check that the user is authorized to use the SET FILE command. If that call is successful, CICS issues the second to check that the user is also authorized to access the file called FILEA.

Specifying RESSEC and CMDSEC for non-terminal transactions

Specifying the RESSEC and CMDSEC options on TRANSACTION resource definitions controls resource and command security checking on all transactions, including transactions that are attached without an associated terminal. If you specify resource or command security checking for a non-terminal transaction, the security check succeeds or fails depending on the access authority of the user associated with the transaction.

Security migration aid

A migration aid is provided that helps you convert your existing CICS internal security definitions into a format acceptable to your security manager.

This aid comes in two parts. Part 1, which was also made available in CICS for VSE/ESA Version 2.3, is shipped as a menu-driven online utility and can be used with both the BSM supplied with VSE/ESA 2.4, and with an ESM.

Part 1 of the aid extracts security information from the control blocks of the CICS system on which it is run, as well as from the II control file. All you need to do is to run the tool against each of your CICS systems that you want to migrate to CICS TS Release 1. The migration aid:

- Extracts all the security data for the CICS system it is being run against, for example, a CICS for VSE/ESA Version 2.3 system, and replaces the security data currently held for that system.

- Runs a complete update of the security data for the current CICS system.

- Displays a list of resources which were previously present in this CICS system.

- Runs a partial extract, based on resource type, replacing all data of this type for this CICS system.

- Runs a partial update, based on resource type, replacing all data of this type for this CICS system.

- Adds, removes, and amends resources manually.

When part one of the migration aid has completed its processing, you receive a VSAM KSDS file which acts as input to part two.

See the *CICS Security Guide* for more information.

Part 2 of the migration aid is supplied with the ESM. VSE/ESA provides a Part 2 migration utility to migrate to the BSM. It is a batch program that reads the output file produced by part one, and uses the information to update the security manager database.

Note: All parameters are retained for CSD compatibility purposes. The presence of an obsolete security operand in a resource definition is ignored in a CICS TS Release 1 environment, but is accepted if it is to be used on an earlier version of CICS. This compatibility support enables you to share your CSD between CICS systems at different release levels, and can help to ease the significant coexistence and migration effort.

Changes affecting console operators (not supported by the BSM)

CICS TS Release 1 passes the console name to the ESM as the "port-of-entry" name at sign-on. Users who need to sign-on to CICS from VSE consoles must be given READ access to a CONSOLE class profile of the same name as the console name.

Changes to system initialization parameters

The following system initialization parameters are new or are changed for the security function in CICS TS Release 1:

- ESMEXITS (new)
- PLTPIUSR (new)
- PLTPISEC (new)
- SEC (new)
- SECPRFX (new)
- XCMD (new)
- XDCT (changed)
- XFCT (changed)
- XJCT (changed)
- XPCT (changed)
- XPPT (changed)
- XPSB (changed)
- XTST (changed)
- XUSER (new)

For a brief summary of these parameters, see "New system initialization parameters" on page 68 and "Changed system initialization parameters" on page 75 respectively. For a full description, see the *CICS System Definition Guide*.

Summary of obsolete function for security

Table 65 summarizes the parameters, keywords, commands, and transactions for security that are obsolete.

Table 65 (Page 1 of 2). Summary of obsolete function for security (alphabetical order)	
Item	**Notes**
CSSF sign off transaction	Retained for compatibility purposes only.
CSSN sign-on transaction	Retained for compatibility purposes only.
DFHACEE user-replaceable program	The MRO security identification program is obsolete.
DFHDCT, destination control table macros	The RSL operand on the DFHDCT TYPE=EXTRA, DFHDCT TYPE=INTRA, and DFHDCT TYPE=REMOTE macros is obsolete.
DFHFCT, file control table macros	The RSL operand on the DFHFCT TYPE=CICSTABLE, DFHFCT TYPE=USERTABLE, DFHFCT TYPE=FILE, and DFHFCT TYPE=REMOTE macros is obsolete.
DFHJCT, journal control table macros	The RSL operand on the DFHJCT TYPE=ENTRY macro is obsolete.
DFHPCT, program control table macros	The TRANSEC operand on the DFHPCT TYPE=INITIAL, DFHPCT TYPE=ENTRY, and DFHPCT TYPE=REMOTE macros are obsolete. The RSL operand on the DFHPCT TYPE=ENTRY and DFHPCT TYPE=REMOTE macros are obsolete. The RSLC operand is renamed to RESSEC.
DFHPPT, processing program table macros	The RSL operand on the DFHPPT TYPE=ENTRY macro is obsolete.
DFHSNT, the sign-on table macros	Obsolete.
DFHTCT, terminal control table macros	• OPERID, OPERPRI, OPERRSL, OPERSEC, and USERID operands on the DFHTCT TYPE=TERMINAL macro. • OPERID, OPERPRI, OPERRSL, OPERSEC, and XSNAME operands on the DFHTCT TYPE=SYSTEM macro. • OPERRSL and OPERSEC operands on the DFHTCT TYPE=REMOTE macro.
DFHXSP and DFHXSE user-replaceable programs	If you use these modules to customize the way CICS uses an ESM, you must use the VSE/ESA SAF interface instead. See the *CICS Customization Guide* for information about how CICS uses the SAF interface to make calls to an ESM. Also see "The EXEC CICS ADDRESS ACEE command" on page 122 for information about the effect the of removal of these modules.
EXTSEC and TRANSEC transaction security options	CICS performs mandatory attach-time security checking by issuing a RACROUTE REQUEST=FASTAUTH macro for all transactions.

3
3

Table 65 (Page 2 of 2). Summary of obsolete function for security (alphabetical order)	
Item	**Notes**
MRO CONNECTION	SECURITYNAME keyword.
PARTITIONSET definition	RSL keyword.
PROGRAM definition	RSL keyword.
MAPSET definition	RSL keyword.
SESSION definition	OPERID, OPERPRIORITY, OPERRSL, OPERSECURITY, and USERID keywords obsolete.
TERMINAL definition	OPERID, OPERPRIORITY, OPERRSL, and OPERSECURITY keywords are obsolete.
TRANSACTION definition	• RSL and TRANSEC keywords obsolete • RSLC keyword renamed to RESSEC.

Migration planning summary

In summary, CICS internal security is obsolete. You can secure your system by using an ESM of your choice that conforms to the VSE/ESA RACROUTE interface, or by using the BSM supplied with VSE/ESA 2.4.

You must protect CICS own assets, data sets, databases, and application source libraries, because CICS does not do so. You must also protect CICS systems from application programs that use undocumented or unsupported interfaces to bypass CICS security.

The key points to remember are:

- CICS internal security is replaced by two security domains.

- If you are using CICS internal security on CICS for VSE/ESA Version 2.3, check the security attributes on resource definitions, and define the required authorizations in your security database in place of the CICS internal resource security keys.

- After you have upgraded the CICS-supplied definitions in your CSD, upgrade any that you have copied and modified.

- Vendor products using the undocumented DFHSEC macro for the purposes of interfacing to CICS security facilities must be changed.

- CICS TS Release 1 introduces transaction-attach security for non-terminal transactions.

- CICS-supplied transactions are classified into three categories for the purpose of security checking and authorization.

- If you migrate existing DCTs that do not specify a user ID for trigger-level transactions, CICS issues the transaction-attach security check against the CICS default user ID.

- You can specify a user ID for programs that are defined in a PLTPI.

- With the removal of the OPERRSL and OPERSEC parameters from the TERMINAL definition, preset terminal security is provided using the USERID parameter in an ESM environment.

- You must use the new sign-on and sign-off transactions, CESN and CESF, rather than the CSSN and CSSF transactions.
- The SECURITYNAME parameter is no longer used for MRO bind-time security checking, nor is it used for any other security purpose on MRO links.

Chapter 21. The Report controller

There are changes to report security and printer security.

Report security

4
4
CICS internal security facilities are obsolete and replaced by the use of an external security manager (ESM) product to manage CICS security requirements. (Note that the BSM does not provide security facilities for the report controller)

To provide security compatibility in an environment managed by an ESM, the report controller requires three sets of resource names defined in the ESM's FACILITY general resource class:

- For report security, define profiles for DFHRCF.RSL01 through DFHRCF.RSL24 and DFHRCF.RSLPU

- For printer security, define profiles for DFHRCF.PRSL01 through DFHRCF.PRSL24 and DFHRCF.PRSLPU

- For browse security, define profiles for DFHRCF.BRSL01 through DFHRCF.BRSL24 and DFHRCF.BRSLPU

In each case, the 01 through 24 and PU suffix in these profile names corresponds to the RSL value held in a report or terminal printer definition. For more information about resource security, see the *CICS Security Guide*.

Reports are protected by the DFHRCF.RSL*nn* resource profile where *nn* is the RSL value of the report. Whenever a program attempts to append to a report (log and resumable reports), or a CEMS or CEOS user attempts to access a report, CICS calls the ESM to ensure the user has the required UPDATE authority.

See the *CICS Report Controller Planning Guide* for more information about the report controller.

Printer security

The report RSL value is also used when printing a report on a CICS terminal printer. In this case, the user ID associated with the terminal printer must have READ authority to DFHRSL.RSL*nn*.

A printer intended for RCF use can be given for control purposes. You specify this using the SPOOLPRTRSL keyword in the terminal resource definition for the printer. User of the CEMS or CEOS transaction require UPDATE authority to DFHRCF.PRSL*nn* to be able to control the printer.

4 Browse security

4
4
The implementation of the report controller browse function is changed to use the facilities of an ESM.

4
4
In earlier releases of CICS, authority to browse is controlled using the RSL of a dummy program, DFHPSBRS, which has to match one of the user's RSL keys.

4	To browse a report under the new ESM security facilities, a user requires READ
4	authorization to the relevant DFHRCF.BRSL*nn* profile, where *nn* is the RSL value
4	of the report.

Migration planning summary

The key points to remember are:

- CICS internal security is obsolete, but CICS ensures compatibility with previous versions of the report controller by continuing to support the RSL values 1-24 for reports.

- With the support of a full-function ESM, the RSL value is used to control access to reports by programs, operators, and printers.

- The RSL value of an RCF printer (SPOOLPRTRSL) is used to control an operators's access to the printer.

- Browse security is changed.

- The BSM does not support any aspect of RCF security.

Chapter 22. Enhancements to XRF

There are several enhancements to the CICS extended recovery facility. For full details, see the *CICS XRF Guide*.

XRF sign-on retention

The introduction of a mechanism for retaining a terminal user's signed-on status over an XRF takeover means that you can now decide whether your XRF-capable terminals can remain signed on following a takeover. For example, those that are in secure areas can be allowed to remain signed on, while those that are not can be signed off.

You can control which terminals are allowed to remain signed on after a takeover by using the following parameters:

XRFSIGNOFF({NOFORCE|FORCE})
> Specify this attribute using the CEDA DEFINE TYPETERM command to control sign-off for groups of terminals.

XRFSOFF={NOFORCE|FORCE}
> Specify this system initialization parameter to control sign-off globally for the CICS system.

The default is NOFORCE, meaning that terminals are not signed off, so that, unless you specify these new parameters, you can migrate your existing system definitions without any effect.

Controlling XRF timeout

If a terminal user remains signed on over an XRF takeover, but the operator leaves the terminal unattended during the takeover period, there is a potential security exposure. To ensure security, you can specify a timeout period for the whole system, so that users who do not use their terminals for the specified period following a takeover can be automatically signed off. You do this by specifying a timeout period, which begins when a takeover is started, using system initialization parameter, XRFSTME:

XRFSTME=*nn*│5

where *nn* is in minutes.

XRFTRSZ SIT parameter removed

The XRFTRSZ system initialization parameter is obsolete because the trace table is acquired above 16MB with a fixed size of 64K.

Change to the APPLID system initialization parameter

The generic and specific APPLIDs cannot be the same if you also specify XRF=YES as a system initialization parameter. If the generic applid and the specific applid are the same with XRF=YES specified, CICS issues message DFHXG6477.

See the *CICS System Definition Guide* for information about the APPLID system initialization parameter.

Overseer program compatibility

There is a change to the format of records that the CICS availability manager (CAVM) writes to the CAVM data sets. Because of this, you cannot use an overseer from an earlier release of CICS to oversee CICS TS Release 1 XRF regions. However, the new overseer does cater for both the old and the new CAVM records. As a result, if you are operating CICS with XRF at different release levels, and you want to use an overseer, you must use the latest version. If you use the CICS-supplied sample overseer program, you can continue to use the existing program as long as you reassemble and link-edit it against the CICS TS Release 1 libraries.

The sample overseer does not take advantage of any new data passed to the overseer by CICS. See the *CICS Customization Guide* for information about writing an XRF overseer program.

Migration planning summary

The key points to remember are:

- To use the new XRF sign-on retention capability, decide which of your terminals can remain signed on after a takeover and specify the options accordingly.

- Review your operator procedures and document the changes.

- The generic and specific APPLIDs can no longer be the same.

- Overseer programs from earlier releases are not compatible with CICS TS Release 1 CAVM data sets. Reassemble any overseer programs from earlier releases.

- Consider using persistent sessions support as an alternative to XRF in some cases. See the *CICS Release Guide*, which describes this new function in more detail.

For information about the changes to security procedures in general, see Chapter 20, "CICS security" on page 167.

Part 7. Problem determination

Table 66. Problem determination road map	
If you want to...	**Refer to...**
Know more about the changes to the problem determination transactions	Chapter 23, "Problem determination and debugging" on page 195
Know more about the changes to trace	Chapter 24, "CICS trace" on page 197
Know more about the changes to dump	Chapter 25, "CICS dump facility" on page 201
Know more about CICS message identifiers	Chapter 26, "CICS messages and codes" on page 205
Know more about the new message format	"Format of information" on page 208
Know more about VSE user abend codes	"VSE user abend codes" on page 211
Know more about the XMEOUT global user exit	"The XMEOUT global user exit" on page 211

Chapter 23. Problem determination and debugging

There are changes to the problem determination process. These changes are the result of enhanced methods of isolating the causes of problems in the new CICS environment, and by the need to distinguish the areas in which you can determine and solve problems from those for which you must contact your IBM Support Center.

The *CICS Problem Determination Guide* gives detailed, step-by-step instructions for problem determination using the new process. This is based on the IBM problem classifications used in the RETAIN database: ABEND, WAIT, LOOP, PERF, and INCORROUT. The guide shows you how to classify the problem, and how to decide whether the cause is located within a CICS module. When the problem is identified, you contact your IBM Support Center with appropriate information.

To help with problem determination, CICS dump and trace are enhanced. There are also some changes to the system initialization parameters, and to the CSFE transaction that you use for problem determination. The changes to trace, dump, and the CSFE transaction are described in the rest of this chapter. For details of the changes to system initialization parameters, see Chapter 11, "Initialization" on page 65.

Changes to the CSFE DEBUG transaction

The syntax of the CSFE DEBUG transaction is changed to match the changed system initialization overrides that control storage checking. Instead of specifying that you want storage checking for the TASK subpool using the TASKSTG=ON|OFF operand, you use:

```
CSFE DEBUG,CHKSTSK={ALL|CURRENT|NONE}
```

Instead of specifying that you want storage checking for the TERMINAL subpool using the value 'TP' for the SUBPOOL operand, you use:

```
CSFE DEBUG,CHKSTRM={CURRENT|NONE}
```

CEDF restriction removed

The restriction is removed that prevented you from using CICS execution diagnostic facility (CEDF) for transactions defined as remote in a terminal-owning region (TOR). In earlier releases, you can use CEDF for remote transactions only by first initiating a transaction-routing session using the CICS-supplied transaction, CRTE. However, using CEDF through a CRTE session does not permit the terminal control "before task attach" global user exit (XZCATT) program to access information that relates to the user transaction being debugged. For example, in a non-EDF environment a global user exit program might require information such as:

- The cursor position, AID, and other information from the TCTTE
- The terminal input data from the TIOA
- The remote transaction code that CICS attaches to the routed transaction.

With the removal of the restriction on the use of CEDF for remote transactions, you can invoke EDF support for debugging without the need to initiate a transaction routing session through CRTE. Because you do not have to invoke CRTE to

enable EDF support in an AOR, the XZCATT global user exit program in the TOR works normally and has access to all the terminal data for the remote transaction.

CEDF constraints for remote transactions

There are some constraints on the use of EDF with remote transactions:

- CICS supports EDF for remote transactions only when all the communicating regions are at the CICS TS Release 1 level.

- The EDF resource definitions (CEDF transaction, supporting programs and mapset) must be installed in all communicating regions, and that the CEDF transaction is defined as local in each region. If you install CEDF in the TOR, but not in the AOR, the user transaction you are debugging abends with an APCT abend.

- Remote EDF support is available only in single-terminal mode (that is, CEDF and the transaction you are debugging are input from the same terminal).

- If you specify at the end of a transaction that the EDF session is to continue for the next transaction, the previous EDF options and saved screens are not preserved and your EDF options must be re-specified.

Migration planning summary

In summary, there are changes when debugging applications using CEDF. The key point to remember is:

- You no longer need to invoke CRTE, to set up a transaction routing session, before using CEDF to debug transactions that run in a remote region. Ensure that EDF resource definitions are installed in all the communicating regions.

Chapter 24. CICS trace

There are major changes to CICS trace, described under the following topics:

- "Different types of trace"
- "Trace points"
- "The new trace transaction, CETR" on page 199
- "The internal trace table" on page 199
- "Auxiliary trace" on page 199

Different types of trace

Several types of CICS trace are available to record different aspects of CICS activities. The types of trace are:

Normal CICS trace

This is performed by the trace (TR) domain at predetermined trace points in
CICS code (and in your application programs, if they issue EXEC CICS
ENTER TRACENUM commands) during the regular flow of control. You get
normal CICS trace when you turn on CICS internal or auxiliary trace.

      CICS also makes an exception trace entry when it detects an exception condition. CICS writes an exception trace entry even if CICS internal trace is switched off.

XRF trace

      This records CICS XRF-related activities and is always active in XRF=YES systems.

Program check and abend trace

      This type of trace is used by CICS to record information when a program check or abend occurs.

Trace points

Trace points are identified by trace point identifiers, each of which contains a two-character domain identifier. Trace points are included at specific points in CICS code, from where trace entries can be written to any currently active trace destination.

Each trace point has an associated level attribute, the value of which depends on where the trace point is and the sort of detail it can provide on a trace call.

Level 1 trace points are designed to give you enough diagnostic information to resolve user errors. They are located:

- On entry to, and exit from, every domain
- On entry to, and exit from, major internal domain functions
- Before and after calls to other program products (for example, VTAM)
- At many of the points where trace calls were made in CICS for VSE/ESA Version 2.3.

Trace points of level 2 and above provide information that is likely to help IBM support staff after you have referred a problem to them.

Levels of trace

You can control trace with a much greater degree of granularity than in previous releases. You specify what levels of trace you require using the new system initialization parameters STNTR, STNTR*xx*, SPCTR, and SPCTR*xx*, which allow you control trace for each component separately.

These allow you to define whether you want tracing to be:

- Standard
- Special
- Suppressed.

The type of trace you choose depends on your specific problem determination requirements.

Volume of trace data

The number and size of trace entries written by CICS is increased. Trace entries are variable in length, and are, on average, approximately three times the length of entries written by previous versions of CICS.

The increase in the number of entries written compared with CICS for VSE/ESA Version 2.3 depends on the trace options you define and the nature of the processing CICS is performing, but is likely to range from 30 to 60 percent. It is necessary to define larger auxiliary trace data sets and use a larger internal trace table. As a general guide, you should consider increasing the size by a factor of four.

Trace entry formats

There are two slightly different trace entry formats, depending on whether the trace point existed in CICS for VSE/ESA Version 2.3. However, formatted trace entries always contain:

The trace point id This is a unique identifier that indicates exactly where the trace point is in CICS code.

An interpretation string This tells you, for example, the module where the trace point is located and the function being performed.

A standard information string This tells you, for example, the task number, the time the trace entry was made, and the interval that elapsed between this and the previous trace entry.

A number of data fields These contain information relevant to the function being performed. For old style trace points, these are shown as fixed length (4 bytes) `FIELD A` and `FIELD B` values in the same line as the interpretation string. Trace entries from old style trace points also include a request type field that gives the same information as the 2-byte request field in the formatted trace entries of CICS for VSE/ESA Version 2.3.

For new style trace points, up to seven variable length data fields are shown immediately below the standard information line.

The new trace transaction, CETR

The new trace transaction, CETR, controls trace facilities for the whole of CICS, including VTAM exit trace. CETR provides screen displays showing:

- The current status of the internal and auxiliary trace destinations

- The current trace selection flags for each function and domain

- The standard, special, and suppressed trace settings for terminals and transactions.

You can modify CICS trace by overtyping the current settings on the CETR panels.

The internal trace table

The minimum size of the internal trace table is 16KB, and the maximum size is determined by the amount of private storage you have available above 16MB in the CICS region. The internal trace table is allocated before the extended DSA (EDSA) using the EDSALIM system initialization parameter. Ensure that your CICS partition is large enough to accommodate the amount of virtual storage needed for both the EDSA and the trace table (on the VSE ALLOC statement).

You can extend the internal trace table from 16KB in 4KB increments. You can also change the size of the table while CICS is running by using CETR and EXEC CICS commands. Internal trace stops while the change is being made, and the data in the existing table is lost.

Exception trace entries

In the restructured part of CICS, when a domain detects an error, it writes an exception trace entry to assist in problem determination by capturing as much data as possible at the first occurrence of the error, and causes a system dump to be taken. The exception trace entry is written to the internal trace table, even if there is no trace destination active.

Auxiliary trace

Auxiliary trace is available from the early stages of initialization. You can specify one or two data sets for auxiliary trace, but CICS requires two if you want to use the new automatic switching facility.

Formatting CICS auxiliary trace entries using DFHTU410

The trace utility program, DFHTU410, which CICS provides for formatting trace entries written to auxiliary trace data sets, replaces the CICS for VSE/ESA Version 2.3 program, DFHTUP. DFHTU410 has seven additional options:

- The ABBREV or FULL options, which you use to specify whether you want an abbreviated form of trace output (which gives you only one line per trace entry), or the full trace output.

- The KE_NUM option, which you use to select entries by specified kernel task numbers.

- The ENTRY_NUM option, which you use to specifiy the sequence numbers of one or more trace entries that you want to print. You can also specify a range of sequence numbers.

- The EXCEPTION option, which you use to specify that only exception trace entries are to be printed.

- The INTERVAL option, which you use to specify the interval between auxiliary trace entries.

- The PAGESIZE option, which you use to specify the number of lines printed on a page.

- The TIMESTAMP option, which you use to specify that time stamps (maximum interval of 9.999999 seconds) are printed instead of the trace sequence numbers in an abbreviated trace.

Migration planning summary

The key points to remember are:

- You can now use the new CETR transaction to control trace from a master terminal.

- You should use EXEC CICS commands to control trace from a program, although you can continue to use the programmable interface to the master terminal program (DFHEMTA) for the CEMT trace functions

- The formats used for trace table entries are changed. Modify any programs that access trace table entries.

- The types of trace available, and the trace point identifiers used, are changed.

Chapter 25. CICS dump facility

The CICS dump facilities are redesigned, and the effects of this are outlined in this chapter.

CICS system dumps

The formatted, snap, storage violation, and CICS region dumps of previous versions are no longer supported. Instead, all CICS system dumps are produced using the VSE SDUMPX macro, written to a SYSDUMP library, which you can format using Info/Analysis with a CICS-supplied dump exit routine, DFHPD410.

Recalculate the space required for your SYSDUMP library to allow for the increased size of your CICS regions.

CICS transaction dumps

CICS transaction dumps continue to be written to the CICS dump data sets, DFHDMPA and DFHDMPB, which are now used only for this purpose.

Transaction dumps are formatted offline using the new CICS utility program, DFHDU410, which replaces the previous dump utility, DFHDUP.

Individual transaction dumps must be formatted in their entirety, but you can select the dumps that you want to format from a dump data set by time, by task ID, by dump code, or by dump ID.

The CICS dump table

You can control the actions of CICS dump by setting dump codes for the various system and transaction dumps in a dump table, using the CEMT transaction or EXEC CICS commands.

The dump table is not assembled and link-edited like the CICS control tables that you define using macro instructions.

You can choose:

- The types of dump you want CICS to record
- Whether dumping is suppressed completely for a given dump code
- The maximum number of dumps CICS is to take during this run
- Whether CICS terminates as a result of the failure that caused a dump.

The options you specify are recorded in the appropriate dump table and saved in the CICS global catalog. For details about controlling dumps with the dump table, see the *CICS System Programming Reference* or the *CICS-Supplied Transactions* manual.

Any dump table entries you have changed or created during a CICS run are preserved over warm and emergency restarts.

However, any dump table options that you set, and which are written to the global catalog, are lost if you perform a cold start or if you delete and redefine the CICS global catalog.

Any temporary dump table entries that CICS creates as a result of a dump request using an undefined dump code are not saved in the dump table, and are lost after a CICS shutdown.

Default dump table entries

If, when you request a dump, you use a dump code that is not in the dump table, CICS makes a temporary dump table entry using default values for the attributes. However, CICS does not write temporary entries to the global catalog, and these are lost when CICS is shut down.

Controlling SDUMPs that precede ASRA and ASRB abends

The message DFHAP0001 is displayed whenever a VSE abnormal end (abend) or program check occurs in the AP domain or a user application program. Unless you have specified otherwise in the dump table, the system default for dump code AP0001 is to take an SDUMP, and an exception entry is made in the trace table. Usually, program checks, or VSE abends caused by an application program, are also followed by an ASRA or ASRB transaction abend and a transaction dump.

The old SIT options for suppressing CICS system dumps (ABDUMP=NO and PCDUMP=NO) are now obsolete. If you want to suppress system dumps that precede ASRA and ASRB abends, you must specify this on an entry in the dump table using either the CEMT transaction or an EXEC CICS command. For example, specifying:

```
CEMT SET SYDUMPCODE(AP0001)  ADD  NOSYSDUMP
```

adds an entry to the dump table for dump code AP0001 and ensures that SDUMPs are not taken for DFHAP0001 messages. This NOSYSDUMP option applies regardless of whether the program check is followed by an ASRA or ASRB transaction abend.

Note: An active HANDLE ABEND command does not prevent CICS from taking an SDUMP for a program check or interrupt abend. The only way you can suppress an SDUMP is by means of a dump table entry for the dump code AP0001 as described above.

If, in some instances, you decide you want the SDUMP for one of these transaction abends but not the other, specify the one you want by using either a CEMT SET TRDUMPCODE or an EXEC CICS SET TRANDUMPCODE command. For example, specifying:

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

adds an entry to the dump table and ensures that SDUMPs are taken for ASRB abends. Note, however, that the SDUMP in this instance will be taken at a later point than the SDUMP normally taken for system dump code AP0001.

For more information about the DFHAP0001 message, see the *VSE/ESA Messages and Codes Volume 3* manual, and for more information about controlling dumps through the dump table, see the *CICS Problem Determination Guide*.

Object-code-only (OCO) dump data

Some of the data included in formatted dumps relate to parts of CICS that are distributed in object form only (OCO). You cannot interpret OCO data directly. However, important summary information is extracted by the dump formatters, DFHDU410 and DFHPD410.

Dump domain global user exits

Because the CICS dump facility is now restructured as a domain, the global user exits for the dump facility are changed. There are three global user exits in the dump domain:

XDUCLSE Invoked when after the dump domain closes a transaction dump data set.

XDUOUT Invoked before the dump domain writes a record to the transaction dump data set.

XDUREQ Invoked before the dump domain takes a system or a transaction dump.

Migration planning summary

The key points to remember are:

* Instead of formatted, snap, storage violation, and region dumps, CICS now takes VSE SDUMPs.

* Recalculate the space you need for your VSE system dump data sets because all CICS system dumps are now written to them.

* The CICS dump data sets contain only transaction dumps.

* CICS dump actions are controlled by dump code entries in a dump table; you can specify dump code entries to a running CICS system by using new EXEC CICS and CEMT commands.

* Some data included in a formatted dump relates to parts of CICS that are distributed in OCO only. You cannot interpret this data directly, but important summary information is extracted by the dump formatter.

* The dump user exits are now global user exits in the dump domain. Rewrite them to the new global user exit interface.

Chapter 26. CICS messages and codes

The messages and codes produced by CICS look very different. Changes have been made for the functional enhancements made to CICS, the restructuring of CICS code, and also to improve the quality of the information given in the messages themselves. The majority of CICS messages are now handled by the message (ME) domain. The message domain acts as a repository for CICS messages, and manages the transmission of messages to transient data destinations or to the console. The ME domain also provides an interface for returning the text of a message to the caller. CICS can produce several types of messages:

- Console messages that advise the system operator of execution progress, or request a decision.

- Messages from CICS-supplied support programs that communicate directly with terminal operators.

- Messages logged (in transient data destinations) by CICS management modules and support programs relating to significant events and errors.

- Message switching responses generated by the CICS message switching program (DFHMSP).

- Informational macro notes (mnotes).

- Messages produced by CICS utility programs such as DFH$MOLS.

Message Identifiers

4   Message identifiers are of two types. Both are prefixed with the letter DFH, the
4   IBM assigned identifier for CICS modules.

4 DFH7nnn identifiers

4   These consist of the prefix DFH7 followed by a three digit message number. They
4   indicate messages that have been issued by command-level translators when
4   processing programs.

DFHccnnnn identifiers

These messages consist of the prefix DFH followed by a two-letter component identifier (*cc*), and a four-digit message number (*nnnn*). The component identifier shows the domain or the component that issues the message. Here is a list of component identifiers with associated domains and components:

AC The abnormal condition program component

AI The auto-install terminal model manager (AITM)

AK The activity keypoint component

AM The RDO allocation manager

AP The application domain

4   **CA** DFHCSDUP and EXEC CICS CREATE

CC The CICS catalog domain (local and global)

CE The sign on program component

CP The CPI Communications component

CR The ISC remote scheduler component

DD The directory manager

DM The domain manager domain

DS The dispatcher domain

DU The dump domain

ER The user backout program

4　**EV** The sequential I/O component

EX The external CICS interface

FC The file control component

FE The FE terminal test program component

IC The interval control program

IR The interregion component

JC The online journal control component

KC The transaction/profile manager

KE The kernel domain

LD The loader domain

LM The lock manager domain

MC The BMS message control program component

ME The message domain

MN The monitor domain

PA The parameter manager domain

PC The program control program component

PD The print dump exit routine DFHPD410

PG The program manager domain

PR The partner resource manager

4　**RC** Report Controller

RD The RDO allocation manager

RM The recovery manager

RT The ISC transaction routing component

RU The recovery utility program

SI The system initialization component

SK The sub task control program component

SM The storage manager domain

SN The signon component

SR The system recovery component

ST The statistics domain

SZ The front end programming interface (FEPI)

TC The terminal control program component

TD The transient data component

TF The terminal facility manager

TI The timer domain

TM The system termination program component

TO The terminal object resolution program component

TP The BMS terminal page retrieval program component

TR The trace domain

TS The temporary storage control program component

US The user domain

WK The warm keypoint component

XA The XRF alternate component

XC The XRF CICS availability manager

XG The XRF general component

XM The transaction manager

XO The XRF CICS availability manager

XS The CICS security component

ZC The terminal control working set component

ZE The TCP error message writer component

ZN The syncpoint component

For example, the CICS message DFHAP0002 is issued from the application domain, which is identified by the two-character identifier AP.

Action codes

Some messages include an action code after the message identifier. An action code is a letter directly following the message number, for example, DFHJC2926I. These codes advise the operator of what action is needed when the message appears on the system console. The following action codes are used:

A Immediate action (for example, mount a tape).

D Immediate decision (reply to a request, for example, enter GO or CANCEL).

E Eventual. Action is required, but does not have to be taken immediately.

I No action required. (If issued via the message domain, these messages can be suppressed by specifying MSGLVL=0 as a system initialization override.)

Severity codes

Some messages, especially those associated with messages to terminal operators and messages which come from CICS utilities, have a severity code. A severity code is a letter separated from the message number by a space, for example, DFHST0210 I. A severity code indicates to the operator whether a message is associated with an error, and if so, how serious it is. The following severity codes are used:

I   Information only. No action is required.

W   Warning. Something may have gone wrong, a program loop for example, but CICS processing continues.

E   Error. Something has gone wrong and action is required of the operator before CICS processing can continue.

S   Severe error. Something serious has gone wrong and immediate action is required. CICS processing is suspended until action has been taken.

Format of information

Each message is presented in the *VSE/ESA Messages and Codes Volume 3* manual in the following format:

Message identifier   In the form DFH*nnnn* or DFH*ccnnnn.* as described in the previous section.

Message text   The words and inserts which make up the message as displayed by CICS

Explanation   The reasons for the production of the message

System action   The action that has been (or will be) taken by CICS

User response   The action you should take

Destination   The device or log to which CICS sends the message. This is one of the following:

- Console–a terminal type attached to CICS. (Route codes are 2 and 11 unless otherwise stated.)

- Terminal end user

- SYSLST – the system printer

- One of the following transient data queues:

  - CADL, the VTAM resource definition log

  - CAIL, the autoinstall terminal model manager (AITM) log

  - CCPI, the common programming interface for communications (CPI Communications) messages

  - CDUL, the transaction dump messages

  - CMIG, the migration log for messages reporting the use of functions that are no longer supported

  - CRDI, the log for installed resource definitions

  - CSDL, the CEDA command log

- CSCS, the sign-on/off security log

- CSFL, the file allocation and related messages log

- CSKL, the log for transaction and profile resource definitions

- CSMT, the log for write term errors and abends from DFHTACP and DFHACP

- CSPL, the log for program resource definitions

- CSRL, the log for partner resource definitions

- CSSL, the statistics log

- CSTL, the term I/O error messages from DFHTACP

- CSML, the sign on/off messages log

- CSNE, the terminal error messages issued from DFHZNAC

4   – CSPW, the CEPW message log

4   – CSPA, the report controller audit log

- CSZL, FEPI message queue

Note: Destination CXRF is used by the alternate CICS system in an XRF environment until the other destinations are made available during the takeover.

Module   The name of the module that determined that the message should be sent. (This is not necessarily the module that issued the macro to write the message.)

XMEOUT parameters

Messages that can drive the XMEOUT global user exit include a list of XMEOUT parameters. The XMEOUT exit allows you to suppress or reroute messages that use the message (ME) domain.

A number of console messages should not be rerouted to a transient data queue. These include all DFHTD*nnnn* messages and some DFHXM*nnnn* and DFHUS*nnnn* messages. A note to this effect is included in the descriptions of these messages.

For programming information about the XMEOUT user exit, see the *CICS Customization Guide*. See "The XMEOUT global user exit" on page 211 for more information about XMEOUT.

Route codes

Console messages can be sent to a number of console types. The type of console to which a particular message is sent is determined by the VSE route code. Each route code maps onto one console type. The meanings of the route codes normally used by CICS are as follows:

Code Meaning

1   Master console action – indicates a change in system status demanding operator action

2   Master console information – indicates a change in system status (system default)

3	Tape pool status or other tape-related information
4	Direct access pool status or other related information
5	Tape library information
6	Disk library information
7	Unit record pool information
8	Teleprocessing control status
9	System security checking
	Note: This route code suppresses the operator's reply on the screen and on SYSLOG
10	System error or maintenance information
11	Programmer information

Unless otherwise stated, console messages have the route codes 2 and 11.

See the *VSE/ESA System Macros Reference* manual for more information about VSE route codes.

Terminal identifiers

Some messages include a terminal identifier (*termid*) in the message text. This is normally shown as a 4-character identifier. However, when CICS cannot completely identify a terminal, for example when intersystem communication is taking place, the terminal identifier is prefixed by the application identification (*applid*) of the system owning the terminal.

Abend code inserts

In some CICS messages the transaction abend code insert (*abcode*) is displayed as ???? when neither the EXEC CICS ABEND request nor the DFHPC TYPE=ABEND macro request specify an abend code.

Dumps

A dump is generally available for printing when a CICS system abend or abnormal termination occurs, provided the relevant data set has been specified. The dump can be used for problem determination.

Terminology

The terms "abnormally terminates" and "abnormal termination" are frequently used in a general sense to relate, as applicable, to one of the following:

- The termination of CICS as a result of a VSE ABEND macro. (The term "abend" may also be used.)

- The termination of a transaction (task) as a result of a CICS transaction ABEND macro.

VSE user abend codes

DFH messages that accompany a CICS region, utility, or subtask abend have an associated VSE user abend code. Where possible, the value of this code is the numeric part of the corresponding DFH message. Thus DFHSI1596 has a 1596 user abend code.

If a VSE abend code is issued but not the associated CICS message, the problem probably does not originate with CICS. See the description of the VSE abend code in the *VSE/ESA Messages and Codes* manual for further information.

The highest possible value of a VSE user abend code is 4095, therefore any DFH message with a number higher than 4095 has a VSE user abend code that does not follow the above convention. See the *VSE/ESA Messages and Codes Volume 3* manual for lists of the abend codes for messages with numbers above 4095, in order of abend code, and in order of message number.

The XMEOUT global user exit

The new XMEOUT global user exit allows you to suppress or reroute CICS messages that use the message domain. Note that your exit program is subject to certain restrictions:

- It can only suppress or reroute messages that use the message domain. You can deduce which messages this applies to from the *VSE/ESA Messages and Codes Volume 3* manual; the description of each message that causes XMEOUT to be driven contains a list of XMEOUT parameters. If no XMEOUT parameters are listed for a message, it means that the message does not cause the exit to be driven.

- It cannot change the text of a message, nor the message inserts. (If it tries to do so, CICS ignores the changes.)

- It cannot suppress or reroute messages issued during the first phase of CICS initialization (because the exit cannot be enabled before the second phase).

- It cannot reroute a message to transient data queues during CICS shutdown unless the original message destination included one or more transient data queues.

- It cannot reroute a message to transient data queues during CICS shutdown unless the original message destination includes one or more transient data queues. If it attempts to do so, the message in question is routed to its original destination, and message DFHME0120 is issued to the console. Message DFHME0120I cannot be rerouted by the user exit program but it may be suppressed.

  This restriction is necessary because the message domain is required to handle messages during CICS shutdown even after the transient data queue function has ended.

  To discover whether CICS shutdown has started, your exit program can check for the first instance of message DFHME0120. It can stop rerouting messages to transient data queues after DFHME0120 has been issued.

- It cannot suppress or reroute messages sent to terminal operators, only those sent to the system console or to transient data queues. (XMEOUT is not invoked for the former type of message.)

CICS supplies the following sample programs, which show you how to use XMEOUT exit to suppress or reroute messages:

DFH$SXP1   Suppresses a message by message number

DFH$SXP2   Suppresses a message by destination route code

DFH$SXP3   Suppresses a message destined for the CSCS transient data queue (which receives sign-on and sign-off messages)

DFH$SXP4   Reroutes a console message to a transient data queue

DFH$SXP5   Reroutes a transient data queue message to another transient data queue

DFH$SXP6   Reroutes a transient data queue message to a console

The source for all these programs can be found in the VSE/ESA sublibrary, PRD1.BASE.

Automated operations

If you use any form of message-based automatic operations, check your implementation to see how any of the messages you use are changed, or if any are deleted. Your operator procedures may need to be rewritten to allow for any changes to the messages, especially where the sequence of messages is changed, or where the system or operator actions associated with the message are changed. Messages that were used in previous releases do not always have a one-to-one replacement. If you use an automatic operator program that responds to CICS messages, check that the messages you use are not changed in any way. If they are changed, you will need to rewrite such programs. Your problem determination procedures may need to be rewritten to allow for any changed abend codes.

See the *VSE/ESA Messages and Codes Volume 3* for detailed information about changes to the individual message sets.

Abnormal termination of CICS

When CICS terminates abnormally, it issues user abend 1800 after issuing message DFHKE1800. This message cannot specify the reason for the abnormal termination (as in previous releases of CICS) because there is now more than one TCB. Instead, the message refers you to any earlier console messages that may be relevant, and also the dumps, for the cause of the problem that caused the abend.

Migration planning summary

The key points to remember are:

- If you use any form of message-based automatic operations, check your implementation to see whether any of the messages you use are changed in any way, or are deleted.

- Your operator procedures may need to be rewritten to allow for any changes to the messages, especially where the sequence of messages is changed, or where the system or operator actions associated with the message are changed.

- Your problem determination procedures may need to be rewritten to allow for any changed abend codes.

Part 8. Performance-related changes

Table 67. Performance tuning road map	
If you want to...	**Refer to...**
Know about the types of monitoring data collected	"Types of monitoring data collected" on page 217
Know about the new system initialization parameters for monitoring	"New monitoring system initialization parameters" on page 218
Know about the new monitoring global user exit, XMNOUT	"New monitoring global user exit, XMNOUT" on page 218
Know about the changes made to problem determination tools for monitoring	"Trace for monitoring" on page 218 and "Dump for monitoring" on page 219 and
Know about the changes made to transactions for monitoring	"Changes to transactions used for monitoring" on page 219 and
Know about the changes made to statistics in general	Chapter 28, "Statistics" on page 223

Chapter 27. Monitoring

There are significant changes to monitoring facilities.

The new monitoring (MN) domain

The new monitoring (MN) domain is responsible for all monitoring functions within CICS. The MN domain runs validation checks on its own control blocks so that errors can be detected and reported as early as possible. All monitoring modules have recovery routines that handle program checks, abends, and loops. Furthermore, program checks in the MN domain resulting from invalid addresses being passed on user event monitoring points (EMPs) are detected early, and an appropriate response returned to the application program.

Data Management Facility (DMF) Data Handler data sets

CICS monitoring domain writes all monitoring data to Data Management Facility (DMF) Data Handler data sets. This data can be used for subsequent processing by the monitoring utility program, DFH$MOLS, with the associated monitoring dictionary utility program DFHMNDUP. For information about these data sets, see "The Data Management Facility (DMF) Data Handler data sets" on page 80.

General information about creating data sets is given in the *CICS System Definition Guide*.

Detailed information about the DMF utility itself and about DFH$MOLS and DFHMNDUP is given in the *CICS Operations and Utilities Guide*.

Types of monitoring data collected

The following types of data are collected by CICS monitoring:

- **Performance class records**
  These records provide detailed transaction and resource usage information that you can use for accounting, performance analysis, and capacity planning. Data contains information relating to individual transaction usage, such as response time, CPU usage, time spent waiting for I/O, and so on. At least one performance record is written for each transaction, You can request performance class records for long-running transactions and by unit-of-work (syncpoints).

- **Exception class records**
  These records provide information about exception conditions experienced by individual transactions. An exception record is created every time the resources being monitored by exception class monitoring become constrained by system bottlenecks. Information in these records can help you identify the constraints that affect the performance of your transactions.

  Exception records are **fixed format**, and the exception data section now contains a single exception record representing a single exception condition.

  The format of an exception record can be mapped to the NEXCDS DSECT which you can generate using the DFHMNEXC macro.

Accounting class and global performance class records are obsolete.

New monitoring system initialization parameters

The MONITOR system initialization parameter, with its positional operands, is replaced by the following parameters:

MN   Activates or deactivates CICS monitoring.

MNEXC
Activates or deactivates exception class monitoring.

MNPER
Activates or deactivates performance class monitoring.

MNCONV
Specifies whether conversational tasks are to have separate performance class records for each terminal I/O request.

MNSYNC
Specifies whether or not separate performance class records are to be produced for each syncpoint request. This excludes syncpoint requests during task termination or rollback.

MNTIME
Specifies whether monitoring should return the timestamp fields (transaction start and stop times) in GMT or local time to an application using the EXEC CICS COLLECT STATISTICS MONITOR(*taskno*) SPI command.

MNFREQ
Specifies the class interval when monitoring should automatically produce a separate performance class record for a long-running transaction.

See the *CICS System Definition Guide* manual for more detailed information about these parameters.

New monitoring global user exit, XMNOUT

There is one global user exit point in the MN domain, XMNOUT, which replaces the monitoring task-related user exit available in earlier releases. Modify any programs using the old monitoring task-related user exit to use XMNOUT, ensuring they conform to the new user exit linkage conventions. Control is passed to the XMNOUT exit before the monitoring record is output to DMF. On return from XMNOUT, the monitoring record is output or suppressed, depending on the exit return code.

For more information about XMNOUT and the new user exit linkage conventions, see the *CICS Customization Guide*.

Trace for monitoring

Each entry to and exit from the MN domain is traced. Request parameter lists together with the result of the domain call are provided.

Exception events are always traced, even if you have trace switched off. This ensures that you can obtain important trace information in the event of a failure.

You can activate tracing by terminal, transaction, or class. There are different levels of trace for each of the domains, each level giving more information about monitoring activity.

The trace point IDs for the MN domain are in the form MN xxxx; the corresponding trace levels are MN 1, MN 3, and MN Exc.

Dump for monitoring

A VSE SDUMP is produced for all system dumps and is written to a VSE dump library. A monitoring domain summary is included in the SDUMP, giving information about items such as:

- Which monitoring services are active
- Whether the XMNOUT exit is active
- The name of the MCT in use
- The user EMP address list
- The highest and lowest EMP IDs
- The number of user clocks
- The CPU option setting
- The CONV option setting
- The user area length
- The user dictionary length
- The user dictionary address

Changes to transactions used for monitoring

The CSTT transaction is obsolete.

The CEMT INQUIRE and SET MONITOR transactions are new.

Changes to EXEC CICS commands used for monitoring

The EXEC CICS ENTER TRACEID option, ACCOUNT, is withdrawn. Remove it wherever it is used.

The EXEC CICS INQUIRE and SET MONITOR commands are new.

Changes to the DFHMCT macro

The monitoring control table definition is revised to make the installation and customization of CICS monitoring easier. In addition, you can now use CICS monitoring without defining a monitoring control table. If you switch on CICS monitoring without an MCT, CICS dynamically builds an MCT using default values. These defaults are as follows:

- All monitoring classes available (exception and performance)
- All CICS-defined data fields are collected
- CPU=NO
- CONV=NO

The DFHMCT TYPE=INITIAL macro

The EVENT parameter is no longer required. The CPU and CONV parameters are added to the TYPE=INITIAL macro.

```
DFHMCT TYPE=INITIAL
       [,SUFFIX=xx]
       [,CPU=YES|NO]
       [,CONV=YES|NO]
```

The DFHMCT TYPE=EMP macro

The ACCOUNT operand of the CLASS parameter is obsolete, as is the ACCOUNT parameter and its options. The other parameters remain as they were in previous versions.

```
DFHMCT TYPE=EMP
       ,CLASS=PERFORM
       ,ID={number|(PP,number|entryname.number}
       [,CLOCK=(number,name1[,name2,...])]
       [,COUNT=(number,name1[,name2,...])]
       [,FIELD=(1,name)]
       [,PERFORM=(option[,...])]
```

The DFHMCT TYPE=RECORD macro

This macro definition is required only when you want to use performance class data fields selectively. It is no longer required for exception class monitoring. The accounting class and global performance data collection are withdrawn in this version. Only the following parameters are now supported on the TYPE=RECORD macro instruction:

```
DFHMCT TYPE=RECORD
       ,CLASS=PERFORM
       [,EXCLUDE={ALL|(n1[,...]})]
       [,INCLUDE=(m1[,...])]
```

The DFHMCT TYPE=FINAL macro

This macro is unchanged.

The DFHEMP macro

The DFHEMP macro is withfrawn. Rewrite your aplication programs to use the EXEC CICS MONITOR command, which provides equivalent function.

Interpreting monitoring data

Although the CICS monitoring record formats in this release are revised and simplified to make it easier for you to write your own offline processors for analyzing the CICS monitoring data, it also means that you need to amend any existing programs.

Each monitoring record consists of:

- SMF header
- SMF product section
- CICS data section.

A CICS data section consists of only one type of monitoring record; that is, a dictionary record, a performance record, or an exception record.

Exception records are self-describing. The content of performance records is described by a dictionary record written before performance class records are written to the DMF data set. To ensure that a performance class dictionary record is available when DMF data sets are switched, there is a new utility, DFHMNDUP, to generate a performance class dictionary record. The data set containing the generated dictionary record is then available to be used in conjunction with unloaded DMF data sets. DFHMNDUP is described in the *CICS Operations and Utilities Guide*.

To process this SMF-format data, your program must recognize the dictionary record and hold the descriptors it provides, so that it can correctly interpret the performance class monitoring records that follow. It must also note the data about lengths and numbers of connectors that is held in the SMF header and the SMF product section. For details of CICS monitoring data record formats, see the *CICS Customization Guide*.

As an example of how to process CICS monitoring data, you can try the monitoring report sample program, DFH$MOLS, which is substantially changed to handle the new monitoring data. See the *CICS Operations and Utilities Guide* for a description of the new version of DFH$MOLS, and for a sample job to unload the DMF data and run the sample program.

Migration planning summary

The key points to remember are:

- All monitoring data is written to Data Management Facility (DMF) Data Handler data sets.

- New system initialization parameters replace the MONITOR= options.

- There are changes to monitoring commands and macros, and the ACCOUNT monitoring option and global performance class data collection are now obsolete.

- Check your DFHMCT macros to ensure that your options and default values are correct for this release. You can use CICS monitoring without an MCT, unless you need to define non-default requirements on the DFHMCT TYPE=EMP|RECORD macros.

- Any programs (offline or online) that interpret monitoring data must be rewritten to use the new monitoring dictionary and record formats.

- Convert any programs that control monitoring online to use the new EXEC CICS commands.

- Any program that used the monitoring task-related user exit in previous releases must be rewritten to use the global user exit and to conform to the new user exit linkage conventions.

- The MONITOR option of the CSTT transaction is replaced by enhancements to the CEMT transaction.

- If you coexist, any monitoring data collected from a CICS for VSE/ESA Version 2.3 system cannot be processed by DMF. You have to continue to use the methods supported in CICS for VSE/ESA Version 2.3.

Chapter 28. Statistics

This chapter discusses changes to CICS statistics.

New statistics (ST) domain

The new statistics (ST) domain controls the collection of resource statistics for a CICS region. The ST domain collects statistical data as follows:

- At intervals you specify
- At system quiesce
- At logical end-of-day
- When you request it.

Data Management Facility (DMF) Data Handler data sets

The CICS statistics domain writes all statistical data to Data Management Facility (DMF) Data Handler data sets. Statistical information written to DMF data sets can subsequently be used by the statistics offline utility program (DFHSTUP) to produce formatted reports.

For information about DMF data sets see "The Data Management Facility (DMF) Data Handler data sets" on page 80.

General information about creating data sets is given in the *CICS System Definition Guide*.

Detailed information about the DMF utility itself and about DFHSTUP is given in the *CICS Operations and Utilities Guide*.

CSSM and CSSN transient data queues withdrawn

The transient data queues CSSM and CSSN are no longer used, because all statistics data is written to a DMF data set. Reassemble your destination control table (DCT) to remove the definitions for CSSM and CSSN.

DLBL statements for DFHSTM and DFHSTN obsolete

Because statistics are written to the DMF data set, remove the DLBL statements for DFHSTM and DFHSTN from the CICS startup job stream. If you have a job step in your CICS startup job stream to execute DFHSTUP, remove it and design a separate VSE job to print statistics from an unloaded DMF data set.

Design the new DFHSTUP job based on your installation's standard methods of handling DMF data sets. There is a sample job in the *CICS Operations and Utilities Guide*, with notes, illustrating how you can process statistics data written to DMF data sets. Note that the new DFHSTUP includes an internal sort, which requires DLBL statements for the necessary sort work files in the DFHSTUP job step. The DFHSTUP sort function requires a sort package, such as DFSORT/VSE, that supports the E15 and E35 exits to run DFHSTUP.

CSTT statistics transaction replaced by CEMT enhancements

The CSTT transaction for controlling CICS statistics in earlier releases is replaced by enhancements to the CEMT transaction. There are three new CEMT statistics options:

- INQUIRE STATISTICS, which causes CICS to return information about the status of CICS statistics collection

- SET STATISTICS, which enables you to set the collection options

- PERFORM STATISTICS, which causes CICS to write to the DMF data set the data collected since the start of the current interval.

Command-level programming interface extensions for statistics

There is a system programming interface to the CICS statistics domain, which enables you to:

- Control the collection and writing of statistics to the DMF data set

- Request the collection of statistics for a specified resource type.

The SPI commands are:

EXEC CICS INQUIRE and **EXEC CICS SET STATISTICS**
These commands enable you to retrieve, and to change, the statistics interval and end-of-day settings.

EXEC CICS COLLECT STATISTICS
This command retrieves the current statistics for a single resource, or global statistics for a class of resources.

EXEC CICS PERFORM STATISTICS RECORD
This command causes CICS to record statistics immediately.

For more information about these commands, see the *CICS System Programming Reference* manual.

Changes in the pattern of statistics collection

The way in which statistics are collected is changed.

Interval statistics
CICS collects statistics at the intervals you specify and writes them to a DMF data set, unless you set statistics recording off. CICS always collects statistics—you cannot stop interval collection—but they are written to DMF only if the statistics recording option is on. You can set statistics recording on or off using the STATRCD system initialization parameter, or by using a CEMT or an EXEC CICS command. This is the basic pattern of all statistics collections. The interval you specify can be between 1 minute and 24 hours, and the default is 3 hours.

Requested statistics
You can also request statistics during collection intervals, in which case CICS writes the statistics accumulated from the start of the current interval. Like the interval statistics it collects, CICS writes requested statistics to a DMF data set, but CICS does not reset the counters as it does for a normal interval collection.

End-of-day statistics
> CICS collects and writes end-of-day statistics at logical end-of-day, or when you perform a normal shut down. The end-of-day statistics data represents the final interval of the day, and CICS writes these also to the DMF data set. (The default logical end-of-day is midnight.)

Unsolicited statistics
> CICS writes statistics about dynamically allocated and deallocated resources (for example, autoinstalled terminals that are logged off and have their definitions deleted from the CICS system) before they are deleted. Such statistics might otherwise be lost. CICS writes these unsolicited statistics to a DMF data set.

New STATRCD system initialization parameter

In addition to using CEMT and the API to switch statistics on or off, you can also use the STATRCD system initialization parameter to control statistics status at CICS startup. The default value for the STATRCD parameter is OFF.

New parameters on XSTOUT global user exit

More information is passed to the XSTOUT global user exit. The DFHUEPAR parameters include the following SMF product section fields as XSTOUT exit-specific parameters:

3
- The collection date in the form mmddyyyy
- The collection date in the form mmddyy
- The collection time in the form hhmmss
- The length of the interval in the form hhmmss
- The interval number.

Enhancements to DFHSTUP

You can select reports by resource type, and set new control parameters to select (or ignore) specific types of resources in a DFHSTUP report.

The file control FC report produced by DFHSTUP is enhanced to improve readability.

New sample statistics program, DFH0STAT

The new sample program, DFH0STAT, illustrates the different ways of using the EXEC CICS INQUIRE and COLLECT STATISTICS commands to produce statistical information about a CICS region. The reports include a CICS and VSE storage analysis. Statistics obtained using EXEC CICS INQUIRE and COLLECT STATISTICS commands can be used to help in specifying the various DSA sizing parameters.

For more information about DFH0STAT, see the *CICS Operations and Utilities Guide* and the *CICS Performance Guide*.

Migration planning summary

The key points are summarized as follows:

- Rewrite any programs (offline or online) that interpret statistics data to use the SMF-format data, instead of the format previously used for the transient data queues CSSM and CSSN. Your operating procedures may also need to be changed accordingly.

- Reassemble your DCT to remove the definitions for destinations CSSL, CSSM, and CSSN.

- Remove any DFHSTM and DFHSTN DLBL statements from your CICS start-up job streams.

- Convert any programs that control statistics online to use the new EXEC CICS commands.

- Change your operating procedures to use the CEMT transaction instead of CSTT.

- Change your CICS startup job stream to remove the old DFHSTUP job step and its associated DLBL statements.

- Develop a new job stream that integrates the DFHSTUP utility with your installation's methods of handling DMF data sets.

- If you have CICS regions coexisting at different release levels, any statistical data collected from a CICS for VSE/ESA Version 2.3 system cannot be processed by DMF. Continue to use the methods supported in CICS for VSE/ESA Version 2.3.

Appendix A. Summary of obsolete functions

Table 68 lists, in alphabetical order, functions that are no longer supported in CICS TS Release 1.

Table 68 (Page 1 of 5). Summary of discontinued support in CICS TS Release 1

Function	Notes
ABDUMP system initialization parameter	Obsolete (not required by new dump domain).
Accounting class monitoring records	The accounting class of data collection is obsolete.
ALEXIT, system initialization parameter	Removed because of the restructure of PLT processing.
ALT, system initialization parameter	The DFHALT table is obsolete.
AMXT, system initialization parameter	Obsolete (not required by new dispatching mechanism).
AUTINST, system initialization parameter	Superseded by AIEXIT, AILDELAY, AIQMAX, and AIRDELAY system initialization parameters.
BFP, system initialization parameter	Obsolete (built-in functions program obsolete).
BTAM terminal networks	Migrate to using VTAM, or coexist with CICS TS Release 1 using a CICS for VSE/ESA Version 2.3 system until you are able to migrate.
CCMF transaction	CCMF is removed from group DFHSTAND.
CICS internal security	CICS internal security is obsolete. There are numerous changes to security mechanisms that impact CICS externals. See Chapter 20, "CICS security" on page 167 for more information.
CMXT, system initialization parameter	Superseded by the RDO TRANCLASS resource definition.
COBOL2, system initialization parameter	VS COBOL II interface is no longer initialized. ALI VS COBOL II programs run under LE/VSE.
CPLD and CPLI transient data queues	DOS PL/I no longer supported.
CSFR, the field engineering transaction	CICS TS Release 1 no longer supports the facility error recognition system (FERS).
CSIR transaction	The IRC session recovery transaction is removed from group DFHISC.
CSJC transaction	The journal control shutdown transaction is removed from group DFHJRNL.
CSMT, the master terminal transaction	CSMT is superseded by the CEMT transaction.
CSOT, the terminal status transaction	CSOT is superseded by the CEOT transaction.
CSSC transaction	CSSC is superseded by the CESF transaction, and is removed from group DFHSIGN.
CSSF, sign-off transaction	CSSF is superseded by the CESF transaction, and is removed from group DFHSIGN.
CSSL transient data queue	Statistics are written to DMF data sets.

Table 68 (Page 2 of 5). Summary of discontinued support in CICS TS Release 1	
Function	**Notes**
CSSM transient data queue	Statistics are written to DMF data sets.
CSSN, transient data queue **and** transaction	The CSSN transaction is superseded by transaction CESF, and its transaction definition is removed from group DFHSIGN. The CSSN transient data queue is obsolete.
CSST, the supervisory terminal transaction	CSST is superseded by the CEST transaction, and its transaction definition is removed from group DFHSTAND.
CSTT, the statistics transaction	CSTT is superseded by the CEMT PERFORM STATISTICS command. The CSTT transaction definition is removed from group DFHSTAND.
DFHACEE, user-replaceable program	DFHACEE is obsolete because of the removal of CICS internal security. See Chapter 20, "CICS security" on page 167 for more information.
DFHAUTO group	The automatic statistics group in DFHLIST is obsolete.
DFHBIF macros	The built-in function group of macros is obsolete.
DFHBMS macros	The basic mapping support group of macros is obsolete.
DFHCSSC program	The DFHCSSC program definition is removed from group DFHSIGN.
DFHDC macros	Use the EXEC CICS DUMP command instead. See "DFHDC macros" on page 250 for more information.
DFHDI macros	Use the EXEC CICS ISSUE command instead. See "DFHDI macros" on page 250 for more information.
DFHEICAL macro	No longer supported (see "DFHEICAL macro" on page 122).
DFHINQUI (EXEC CICS INQUIRE and SET group)	The following program definitions are obsolete in group DFHINQUI: DFHEIQDS, DFHEIQDU, DFHEIQIR, DFHEIQRQ, DFHEIQSA, DFHEIQSC, DFHEIQSJ, DFHEIQSK, DFHEIQSM, DFHEIQSP, DFHEIQST, DFHEIQST, DFHEIQSX, DFHEIQTR, and DFHEIQVT. The group DFHINQUI itself is **not** obsolete.
DFHEMP macros	The event monitoring point macros are obsolete and are replaced by the EXEC MONITOR command.
DFHEXEC group	The definition for group DFHEXEC is removed from DFHLIST.
DFHFC macros	Replaced by various commands. See "DFHFC macros" on page 250 for more information.
DFHFCS program	The DFHFCS program definition is removed from group DFHOPCLS (dynamic open and close group).
DFHIC macros	Replaced by various commands. See "DFHIC macros" on page 251 for more information.
DFHJC macros	Use the EXEC CICS WRITE JOURNALNUM command instead. See "DFHJC macros" on page 251 for more information
DFHKC macros	See "DFHKC macros" on page 252 for more information.
DFHLIST2 list	DFHLIST2 is merged into DFHLIST
DFHMASTT group	The program definitions for programs DFHMTPA through DFHMTPG (related to CSMT) are obsolete, and their definitions are removed from group DFHMASTT.
DFHMGM macro	The TYPE=DSECT and TYPE=MSG operands are obsolete.
DFHMCT TYPE=INITIAL macro	The CONV and CPU operands are obsolete.
DFHNEP program	The DFHNEP program definition is removed from group DFHMISC.
DFHNUM group	The numeric sign-off resource group is removed from DFHLIST.

Function	Notes
DFHOC macros	Use the EXEC CICS SET DUMP, FILE, and TDQUEUE commands instead. See "DFHOC macros" on page 252 for more information.
DFHOCP program	Obsolete program in group DFHOPCLS (dynamic open and close group).
DFHOPER (EXEC master terminal group)	Program definitions DFHETMA through DFHETMI are removed from group DFHOPER. DFHOPER itself is **not** obsolete.
DFHPC macros	Use the EXEC CICS LINK, RETURN, XCTL, ABEND, and LOAD commands instead. See "DFHPC macros" on page 253 for more information.
DFHPCT table macro	Use RDO instead.
DFHPLI group	PL/I support group is removed from DFHLIST as DOS PL/I is no longer supported.
DFHPPT table macro	Use RDO instead.
DFHRTY program	The DFHRTY program definition is removed from group DFHMISC3.
DFHSC macros	Use the EXEC CICS GETMAIN and FREEMAIN commands instead.
DFHSG macros	Support for system generation is obsolete.
DFHSEC macro	The TYPE=DSECT, TYPE=CHECK, and TYPE=USERID operands are obsolete.
DFHSNT, the sign-on table macro and program	SNT data must be stored in an ESM database. See Chapter 20, "CICS security" on page 167 for more information. The DFHSNT program definition is removed from group DFHSIGN in DFHLIST.
DFHSP macros	Use the EXEC CICS SYNCPOINT command instead. See "DFHSP macros" on page 253 for more information.
DFHSTAND (standard entries group)	The following program definitions are removed from group DFHSTAND: DFHCCMF, DFHCMON, DFHSTKC, DFHSTLK, DFHSTPD, DFHSTTD, and DFHSTTR. The transactions CCMF and CSTT are also obsolete.
DFHTCT table macro for VTAM	Obsolete. Use RDO instead.
DFHTD macro	Use the EXEC CICS READQ, DELETEQ, and WRITEQ TD commands instead.
DFHTIME group	The time-of-day adjustment group is removed from DFHLIST.
DFHTR macros	Use the EXEC CICS ENTER TRACENUM command instead.
DFHTS macros	Use the EXEC CICS READQ, DELETEQ, and WRITEQ TS commands instead.
DFHUAKP group and program	The group to isolate DFHUAKP is removed from DFHLIST, and the program definition for DFHUAKP in group DFHMISC3 is also removed.
DFHXSP user replaceable module	Use an ESM.
DFHXSE user replaceable module	Use an ESM.
DIP, system initialization parameter	DFHDIP is now always loaded as part of the CICS nucleus.
Direct access to CICS control blocks	See "Changes to control block access and usage" on page 121 for more information.
DTB, system initialization parameter	All dynamic log records are spilled to main storage allocations in the ERDSA.

Table 68 (Page 3 of 5). Summary of discontinued support in CICS TS Release 1

Table 68 (Page 4 of 5). Summary of discontinued support in CICS TS Release 1	
Function	**Notes**
Dump analyzer, DFHDAP	DFHDAP is replaced by the Info/Analysis dump exit, DFHPD410.
EXEC, system initialization parameter	Command-level support is now mandatory.
EXITS, system initialization parameter	The user-exit interface is now always initialized.
EXTSEC, system initialization parameter	Use the SEC system initialization parameter instead.
EXTSEC, RDO TRANSACTION definition	Obsolete. However, retained in "compatibility" mode for earlier releases of CICS.
FERS, system initialization parameter	The facility error recognition system (FERS) is obsolete.
Global performance monitoring records	Obsolete. See Chapter 27, "Monitoring" on page 217 for more information.
Global user exits	The following GLUEs are obsolete in CICS TS Release 1: XFCIN, XFCINC, XFCIOER, XFCOUT, XFCOUTC, XFCSET, XFFDSUP, XKCAWT, XKCBWT, XKCDISP, XRCDBER, XSCREQ, XSPPH1C, XTCACOM, XTCACSS, XTCARA1, XTCARA2, and XTCRDAT.
ICVS, system initialization parameter	The stall purge mechanism is superseded.
INSERVICE option on the SESSIONS definition	Although obsolete in CICS TS Release 1, it is retained in "compatibility mode" for earlier releases only.
LESTG, system initialization parameter	Obsolete because of improved DSA management for storage above 16MB.
Macro-level programming interface	Rewrite macro-level programs to command-level standards.
MONITOR system initialization parameter	Replaced by new system initialization parameters for monitoring. See Table 16 on page 68 for more information.
NLT, system initialization parameter	The nucleus load table is obsolete in CICS TS Release 1.
OPERID option on the RDO SESSIONS and TERMINAL definitions	Although obsolete in CICS TS Release 1, they are retained in "compatibility mode" for earlier releases only.
OPNDLIM, system initialization parameter	Obsolete
OPERPRIORITY option on the RDO SESSIONS and TERMINAL definitions	Although obsolete in CICS TS Release 1, they are retained in "compatibility mode" for earlier releases only.
OPERPSECURITY option on the RDO SESSIONS and TERMINAL definitions	Although obsolete in CICS TS Release 1, they are retained in "compatibility mode" for earlier releases only.
OPERRSL option on the RDO TERMINAL and SESSIONS definitions	Although obsolete in CICS TS Release 1, OPERRSL is retained in "compatibility mode" for earlier releases only.
PCDUMP, system initialization parameter	You can now suppress ASRA system dumps by adding an entry to the dump table using a CEMT SET SYDUMPCODE or EXEC CICS SET SYDUMPCODE command.

Table 68 (Page 5 of 5). Summary of discontinued support in CICS TS Release 1

Function	Notes
PCT, system initialization parameter	All transactions and profiles must be defined using RDO.
PGSIZE, system initialization parameter	The CICS virtual page size is now fixed at 4096 bytes.
PLI, system initialization parameter	CICS TS Release 1 does not support the DOS PL/I programming language.
PPT, system initialization parameter	All programs, mapsets, and partitionsets must be defined using RDO.
PRIMEDSIZE option on the TRANSACTION definition	Although obsolete in CICS TS Release 1, PRIMEDSIZE is retained in "compatibility mode" for earlier releases only.
Production and generation sublibrary split	Not supported in VSE/ESA Version 2 Release 4 or in CICS TS Release 1.
RPG programming language	CICS TS Release 1 does not support the RPG programming language.
RSL option on the RDO PROGRAM, MAPSET, PARTITIONSET, and TRANSACTIONS definitions	Although obsolete in CICS TS Release 1, they are retained in "compatibility mode" for earlier releases only.
SCS, system initialization parameter	Obsolete because of the changes made to storage facilities.
SECURITYNAME keyword on the CONNECTION definition	Obsolete for **MRO connections only**.
SIMODS, system initialization parameter	Obsolete because system initialization overlays are not supported in CICS TS Release 1.
START=EMERGENCY	Replaced by START=AUTO.
SVD, system initialization parameter	Superseded by the dump table.
System generation (SYSGEN)	System generation no longer supported.
System initialization overlays	Obsolete.
Tclass option on the RDO TRANSACTION definition	Although obsolete in CICS TS Release 1, Tclass is retained in "compatibility mode" for earlier releases only.
TRACE, system initialization parameter	Replaced with several new tracing parameters.
TRANSACTION attribute on the RDO SESSIONS definition	Although obsolete in CICS TS Release 1, TRANSACTION is retained in "compatibility mode" for earlier releases only.
Transaction class limit	The transaction class limit of 10 transactions is changed to unlimited.
Transaction dump formatter	DFHDUP is replaced by the transaction dump utility, DFHDU410.
TRANSEC option on the RDO TRANSACTION definition	Although obsolete in CICS TS Release 1, TRANSEC is retained in "compatibility mode" for earlier releases only.
XRFTRSZ, system initialization parameter	XRF trace table is now above the 16MB line and has a fixed size of 64KB.
ZCP system initialization parameter	The ZCP modules, DFHZCB, DFHZCX, and DFHZCZ can no longer be suffixed.

Appendix B. Summary of changes to the IBM-supplied RDO groups

Changes to to the IBM-supplied CSD groups

This appendix summarizes the changes made to the CSD groups supplied by IBM.

Note that the TRANSACTION resource definition keyword, RSLC, is renamed to RESSEC. Unless otherwise stated, RSLC(YES|NO) is now RESSEC(YES|NO).

DFHAI62—Group to define sample DFHZATDY

The definitions in the new group DFHAI62 define the sample APPC autoinstall control program, DFHZATDY, and the CONNECTION and SESSION pairs that are used by DFHZATDY.

The definitions in group DFHAI62 are skeletons; you need to modify them to suit your needs.

DFHAKP—The activity keypoint group

Table 69. Changes to group DFHAKP

Definition	Changes made
Definition for program DFHAKP	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSKP	• TASKDATALOC(BELOW), TASKDATAKEY(CICS) added • EXTSEC, TRANSEC, and RSL keywords removed

DFHAUTO—The automatic statistics group

The automatic statistics group, DFHAUTO, is obsolete and is deleted. The programs DFHSTSP, DFHTRNSM, and DFHTRSN, and the transaction CAUT are obsolete. For information about the enhancements made to statistics facilities, see the *CICS Release Guide*.

DFHBACK—The dynamic backout group

Table 70. Changes to group DFHBACK

Definition	Changes made
Definition for program DFHDBP1$	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHDBP2$	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed

DFHBMS—The terminal page retrieval group

Table 71. Changes to group DFHBMS	
Definition	**Changes made**
Definitions for programs DFHTPQ, DFHTPR, and DFHTPS	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSPG	• Value on the TWASIZE keyword increased from 800 to 1024 • PROFILE changed from DFHCICST to DFHCICSP **1** • TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definitions for transactions CSPQ and CSPS	• Value on the TWASIZE keyword reduced from 256 to 0 • TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

Note: **1** The effect of the CSPG transaction referring to the new profile, DFHCICSP, is that lowercase paging commands are no longer ignored for terminals that are defined with UCTRAN(NO). DFHCICSP specifies UCTRAN(YES), causing input for CSPG to be translated to uppercase, even though terminal input is not translated.

In CICS for VSE/ESA Version 2.3, if you enter a lowercase paging command, such as p/1, and the terminal specifies UCTRAN(NO), the command is not recognized as a BMS page retrieval command. This allows some applications to exploit lowercase paging commands, and use character strings such as p/1 for their own purpose. If you have applications that are using lowercase paging commands in this way, be aware that the DFHCICSP profile referenced by CSPG ensures that lowercase BMS paging commands are translated to uppercase. Thus p/1 is interpreted as P/L, and won't work for your applications as in earlier releases.

To make CSPG work as in CICS for VSE/ESA Version 2.3, you should create your own copy of the CSPG transaction definition, and change the profile parameter to DFHCICST.

DFHCONS—The DOS console support group

Table 72 (Page 1 of 2). Changes to group DFHCONS	
Definition	**Changes made**
Definition for program DFHCWTO	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CWTO	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

Table 72 (Page 2 of 2). Changes to group DFHCONS	
Definition	**Changes made**
Definition of TYPETERM DFHCONS	**1**

Notes for Table 72 on page 234:

1 The new CICS-supplied TYPETERM, DFHCONS, specifies PAGESIZE(1,124) whereas the DFHTCT macro of previous releases defaults to a PAGESIZE of (6,80). If you have applications that rely on the DFHTCT default page size, you need to create your own copy of the DFHCONS TYPETERM definition and change the PAGESIZE back to (6,80).

DFHEDF—The execution diagnostic group

Table 73. Changes to group DFHEDF	
Definition	**Changes made**
Definitions for programs DFHDBMS, DFHEDFBR, DFHEDFD, DFHEDFP, DFHEDFR, and DFHEDFX	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHEDFE	New
Definition for map set DFHEDFM	No changes
Definitions for programs DFHEIGDS and DFHEITAB	• CEDF(NO) and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CEBR	• TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CEDF	• Value on TWASIZE keyword reduced from 174 to 0 • TASKDATALOC(ANY), TASKDATAKEY(CICS), and CMDSEC(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition of program DLZHLPI (DOS DL/I language table) is moved into group DFHEDF from group DFHMISC	• CEDF(NO) keyword added • RSL keyword removed

DFHEXEC—The group for general EXEC modules

The group for general EXEC modules, DFHEXEC, is deleted. The programs DFHEOP, DFHEDCP, and DFHETRX are obsolete.

DFHFE—The FE terminal test group

Table 74. Changes to group DFHFE	
Definition	**Changes made**
Programs DFHFED1, DFHFED2, DFHFELG, DFHFERR and DFHFETX	These programs are obsolete because CICS does not support the facility error recognition system (FERS). The program definitions are removed from the group.
Definitions for programs DFHTRAP and DFHFEP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSFE	• Value on the TWASIZE keyword reduced from 100 to 0 • TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for the CSFR transaction	The field engineering transaction, CSFR, is obsolete and the transaction definition is removed from the group.

DFHHARDC—The 3270 print support group

Table 75. Changes to group DFHHARDC	
Definition	**Changes made**
Definition for program DFHP3270	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSPP	• Value on the TWASIZE keyword reduced from 100 to 0 • TASKDATALOC(BELOW), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHINQUI—The group for EXEC CICS special commands

Table 76. Changes to group DFHINQUI	
Definition	**Changes made**
Definition for program DFHEITBS	New
Definitions for programs DFHEIQDS, DFHEIQDU, DFHEIQIR, DFHEIQRQ, DFHEIQSA, DFHEIQSC, DFHEIQSJ, DFHEIQSK, DFHEIQSM, DFHEIQSP, DFHEIQSQ, DFHEIQST, DFHEIQSX, DFHEIQTR, and DFHEIQVT	All the programs defined in group DFHINQUI in CICS for VSE/ESA Version 2.3 are now loaded as part of the CICS nucleus. Therefore they do not need entries in the CSD. DFHINQUI contains only the definition for program DFHEITBS.

DFHINTER—The command interpreter group

Table 77. Changes to group DFHINTER	
Definition	**Changes made**
Definitions for programs DFHECID, DFHECIP, and DFHECSP	• Keywords CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) added • RSL keyword removed
Definition for transaction CECI	• TASKDATALOC(BELOW), TASKDATAKEY(USER), DTIMOUT(10), and CMDSEC(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CECS	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHISC—The intersystem communication group

Table 78 (Page 1 of 3). Changes to group DFHISC	
Definition	**Changes made**
Definitions for profiles DFHCICSF, DFHCICSR, and DFHCICSS	No changes
Definition for program DFHCRP	Removed. Replaced by DFHAPRT, which handles transaction routing. Program DFHAPRT, which does not require a resource definition in the CSD, invokes the dynamic transaction routing program for all terminal-related transactions that are defined as dynamic, and when such transactions terminate either normally or abnormally.
Definitions for programs DFHCRNP, DFHCRQ, DFHCRR, DFHCRS, DFHCRT, DFHCRSP, DFHDYP, DFHLUP, DFHMXP, and DFHRTE	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHZLS1, DFHCLS3, DFHCLS4, and DFHRTC	New
Definition for program DFHMIRS	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CLS1	• PROGRAM(DFHLUP) changes to PROGRAM(DFHZLS1) • SHUTDOWN(ENABLED), TASKDATALOC(ANY), and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CLS2	• SHUTDOWN(ENABLED), TASKDATALOC(BELOW), and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

Table 78 (Page 2 of 3). Changes to group DFHISC	
Definition	**Changes made**
Definitions for transactions CLS3 and CLS4	New. These transactions relate to LU6.2 management services.
Definition for transaction CMPX	• TASKDATALOC(BELOW) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CRSQ	• TASKDATALOC(BELOW), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CRSR	• Value on the TWASIZE keyword reduced from 16 to 0. If you are using your own version of CRSR from a group other than DFHISC, you must ensure that the relevant TWA sizes are changed (the UPGRADE command does not operate on groups other than IBM-supplied groups that begin with "DFH"). • Value on the PRIORITY keyword increased from 1 to 253 • SHUTDOWN(ENABLED), TASKDATALOC(BELOW), and TASKDATAKEY(CICS), keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CRTE	• TASKDATALOC(BELOW), TASKDATAKEY(CICS), and CONFDATA(YES), keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CSIR	Removed because transaction CSIR is obsolete.
Definition for transaction CSSF	To provide compatibility with earlier releases of CICS, a new definition for transaction CSSF is included in DFHISC. CSSF invokes program DFHRTC for the following reasons only: 1. For use by CICS to perform remote system disconnection (CANCEL) of the CRTE session when you are using CRTE to transaction-route to another CICS TS region 2. For use by existing application programs that issue EXEC CICS START CSSF commands to sign off users. These are the only purposes for which CSSF is retained; you cannot use CSSF as a terminal transaction.
Definition for transactions CSMI, CSM1, CSM2, CSM3 and CSM5	• TASKDATAKEY(USER), and CONFDATA(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

Table 78 (Page 3 of 3). Changes to group DFHISC	
Definition	**Changes made**
Definition for transaction CSNC	• Value of the TWASIZE keyword reduced from 288 to 0. If you are using your own version of CSNC from a group other than DFHISC, you must ensure that the relevant TWA sizes are changed (the UPGRADE command does not operate on groups other than IBM-supplied groups that begin with "DFH"). • TASKDATALOC(BELOW) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CXRT	• TASKDATALOC(BELOW) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transactions CEHP and CEHS	• TASKDATAKEY(CICS) keyword added • TRANSEC, and RSL keywords removed
Definition for transactions CPMI and CVMI	• TASKDATALOC(BELOW), TASKDATAKEY(USER), and CONFDATA(YES) keywords added • TRANSEC and RSL keywords removed
Definition for program DFHCCNV	• CEDF(NO), DATALOCATION(ANY),and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHCNVJP, DFHCNVKO, DFHCNVSC, and DFHCNVTC	• The RSL keyword removed
Definition for program DFHCHS	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHCNV	• CEDF(NO) and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHUCNV	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CRTX	Definition for the new dynamic transaction-routing transaction

DFHJRNL—The journal bootstrap group

Table 79 (Page 1 of 2). Changes to group DFHJRNL	
Definition	**Changes made**
Definition for program DFHJCBSP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHJCC	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed

Table 79 (Page 2 of 2). Changes to group DFHJRNL	
Definition	**Changes made**
Definition for program DFHJCEOV	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHJCI, DFHJCIOE, DFHJCKOJ, and DFHJCO	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHJCSDJ	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSJC	The definition for the journal control bootstrap transaction, CSJC, is removed.

DFHMASTT—The old master terminal group

The old master terminal group, DFHMASTT, is obsolete. The programs DFHMTPA through DFHMTPG, and the transactions CSMT, CSOT, and CSST are obsolete.

DFHMISC—The miscellaneous group

Table 80. Changes to group DFHMISC	
Definition	**Changes made**
Definition for program DFHNEP	Removed
Definition for program DFHPEP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHRTY	Removed. Replaced by a new transaction restart program, DFHREST.
Definition for program DFHREST	New
Definition for program DLZHLPI	Moved to group DFHEDF

DFHMISC3—The miscellaneous group

Table 81. Changes to group DFHMISC3	
Definition	**Changes made**
Definition for program DFHNET	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed

DFHMISC3 is not included in the IBM-supplied list of groups, DFHLIST.

DFHMSWIT—The message switching group

Table 82. Changes to group DFHMSWIT	
Definition	**Changes made**
Definition for program DFHMSP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CMSG	• Value of the TWASIZE keyword increased from 520 to 528 • TASKDATALOC(BELOW), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHNUM—The numeric sign off group

The numeric sign off group, DFHNUM, is obsolete. The transactions 8888 and 9999 are obsolete.

DFHOPCLS—The dynamic open and close group

Table 83. Changes to group DFHOPCLS	
Definition	**Changes made**
Definition for program DFHFCS	Removed
Definition for program DFHFCU	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHOPC	Removed
Definition for transaction CSFU	• TASKDATAKEY(CICS) and TASKDATALOC(BELOW) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHOPER—The EXEC master terminal group

Table 84 (Page 1 of 2). Changes to group DFHOPER	
Definition	**Changes made**
Definitions for programs DFHEITMT, DFHEITOT, and DFHEITST	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHEMA through DFHEMI	Removed
Definitions for programs DFHEMTA, DFHEMTD, DFHEMTP, DFHEOTP, and DFHSTP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed

Table 84 (Page 2 of 2). Changes to group DFHOPER	
Definition	**Changes made**
Definitions for programs DFHCETRA, DFHCETRB, DFHCETRC, and DFHCETRD	Definitions defining the new CETR application programs
Definitions for map sets DFHCTRM and DFHCTRH	New definitions for the main CETR mapset (DFHCTRM) and the HELP panel map set (DFHCTRH)
Definition for transaction CETR	Definition for the new CICS-supplied transaction for tracing facilities, CETR.
Definition for transaction CEMT	• Value of the TWASIZE keyword reduced from 512 to 0 • SHUTDOWN(ENABLED), TASKDATALOC(BELOW), TASKDATAKEY(CICS), and CMDSEC(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CEOT	• Value of the TWASIZE keyword reduced from 512 to 0 • TASKDATALOC(BELOW) TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CEST	• Value of the TWASIZE keyword reduced from 512 to 0 • TASKDATALOC(BELOW), TASKDATAKEY(CICS), DTIMOUT(10), and CMDSEC(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHPLI—The PL/I support group

The group for PL/I support, DFHPLI, is obsolete because DOS PL/I is no longer supported.

DFHPGAIP—The program manager autoinstall group

The group for program manager autoinstall is new. It includes definitions for the program autoinstall exits and the default model programs. For more information about program manager autoinstall, see the *CICS Resource Definition Guide*. For information about program autoinstall exits, see the *CICS Customization Guide*.

DFHRMI—The resource manager interface group

Table 85. Changes to group DFHRMI	
Definition	**Changes made**
Definition for program DFHRMSY	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CRSY	• TASKDATALOC(BELOW) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHRSEND—The VTAM resend program group

Table 86. Changes to group DFHRSEND	
Definition	**Changes made**
Definition for program DFHZRSP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSRS	• Value on the TWASIZE keyword is reduced from 008 to 0 • TASKDATALOC(ANY), and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHRSPLG—The response logging group

Table 87. Changes to group DFHRSPLG	
Definition	**Changes made**
Definition for program DFHZRLG	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSLG	• TASKDATALOC(ANY) and TASKDATAKEY(CICS) keyword added • EXTSEC, TRANSEC, and RSL keywords removed

DFHSIGN—The CICS sign on group

Table 88 (Page 1 of 2). Changes to group DFHSIGN	
Definition	**Changes made**
Definition for program DFHCSSC	Removed
Definitions for map sets DFHSNLE and DFHSNSE	New
Definitions for programs DFHSFP and DFHSNP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for programs DFHSNT	Removed because DFHSNT is obsolete.
Definitions for programs DFHCESC and DFHCEGN	New
Definitions for transactions CESC and CEGN	Definitions for the new terminal timeout (CESC) and goodnight transaction stub (CEGN) transactions.
Definition for transaction CESN	• TASKDATALOC(BELOW), TASKDATAKEY(CICS), DTIMOUT(10), and CONFDATA(YES) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definitions for transactions CSSC, CSSF, and CSSN	Removed because these transactions are obsolete. See page 238 for more information about CSSF.

Table 88 (Page 2 of 2). Changes to group DFHSIGN	
Definition	**Changes made**
Definition for transaction CESF	Definition for the new sign off transaction, CESF.

Note for Table 88 on page 243:

DFHSPI—The resource definition online (RDO) group

Table 89. Changes to group DFHSPI	
Definition	**Changes made**
Definitions for programs DFHAMP, DFHDMP, DFHEDAD, DFHEDAP, DFHEITSP, DFHPUP, DFHTOR, DFHZATD, DFHZATS, DFHZATDX, and DFHTBS	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHZATA, DFHZATR, DFHZATMD, DFHZATMF, DFHZCTDX, DFHZDTDX, and DFHZPTDX	New
Definition for program DFHZCQ	• Residency changed from NO to YES • CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CATD	• TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definitions for transactions CATA and CATR	Definitions for the new autoinstall terminal (CATA) and restart autoinstalled terminal (CATR) transactions.
Definitions for transactions CITS, CDTS, CFTS, and CMTS	• Value of TWASIZE keyword increased from 253 to 255 • PROFILE changed from DFHCICST to DFHCICSV • TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • TRANSEC and RSL keywords removed
Definitions for transactions CRMD and CRMF	New
Definitions for transactions CEDA, CEDB, and CEDC	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHSTAND—The standard entries group

The standard entries group, DFHSTAND, is mandatory.

Table 90. Changes to group DFHSTAND	
Definition	**Changes made**
Definitions for profiles DFHCICSA, DFHCICSE, DFHCICST, and DFHCICSV	No changes
Definitions for profiles DFHCICSP, DFHPPF01, and DFHPPF02	New
Definitions for programs DFHACP, DFHPSIP, DFHQRY, DFHTEP, and DFHTEPT	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for programs DFHCCMF, DFHCMON, DFHSTKC and DFHSTLK	Removed because these programs are obsolete.
Definitions for programs DFHSTP and DFHTACP	• CEDF(NO), DATALOCATION(BELOW), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for transactions CCMF and CSTT	Removed because these transactions are obsolete.
Definition for transaction CQRY	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definitions for transactions CSAC and CSTE	• SHUTDOWN(ENABLED), TASKDATALOC(BELOW), and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definitions for transaction CXCU	• PROGRAM(DFHZXCU) changes to PROGRAM(DFHCXCU)
Definition for transaction CXRE	• TASKDATALOC(ANY) and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for programs DFHZXCU, DFHZXRE, and DFHZXST	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for program DFHCXCU	New
Definition for map set DFHXMSG	RSL keyword removed

DFHTCL—Group for IBM-supplied TRANCLASS definitions

Transaction classes (TRANCLASS) are RDO-defined resources. This allows you to have as many transaction classes as you need. A TRANCLASS defintion is identified by eight-character names instead of the numbering scheme used on the now-obsolete CMXT system initialization parameter.

Group DFHTCL contains definitions for the ten CICS-defined TRANCLASSes provided as replacements for the ten TCLASSes defined on the CMXT parameter. These replacements are named DFHTCL01 through DFHTCL10. See the *CICS Resource Definition Guide* for more information about transaction classes.

For compatibility with your old system definitions, you can leave your old transaction definitions as they are, with TCLASS numbers defined, and allow CICS to assign the transactions to the corresponding TRANCLASS names when the transaction definitions are installed. To ensure that the default TRANCLASS names have the same effect as your current TCLASS numbers, you should copy and modify the DFHTCLnn definitions, specifying values that correspond to your old system values.

The example in Table 91 illustrates how to tailor the default classes.

Table 91. Modifying default DFHTCL transaction classes to match old system values		
Obsolete system initialization parameters	**TCLASS in existing transaction definitions**	**Required changes to MAXACTIVE and PURGETHRESH in the transaction class definitions in the DFHTCL group**
CMXT=(50, , ,10,,15)	• TCLASS(01) • TCLASS(04) • TCLASS(06)	• Change MAXACTIVE in DFHTCL01 from 01 to 50 • Change MAXACTIVE in DFHTCL04 from 01 to 10 • Change MAXACTIVE in DFHTCL06 from 01 to 15

Discarding transaction classes

You can use the EXEC CICS DISCARD or CEMT DISCARD command to remove installed transaction class resource definitions from a CICS address space. Unlike other CICS resource types that begin with DFH, and which cannot be discarded, the default TRANCLASS definitions beginning with the prefix DFH are an exception and can be discarded.

DFHTIME—The time of day adjustment group

The time of day adjustment group, DFHTIME, is deleted. The program DFHTAJP, and the transaction CSTA, are obsolete.

DFHVTAM—The VTAM group

Table 92. Changes to group DFHVTAM

Definition	Changes made
Definitions for programs DFHGMM, DFHZNAC, and DFHZNEP	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definition for transaction CSGM	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed
Definition for transaction CSNE	• Value of the TWASIZE keyword is reduced from 584 to 0 • SHUTDOWN(ENABLED), TASKDATALOC(ANY), and TASKDATAKEY(CICS) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHVTAMP—The VTAM 3270 print group

Table 93. Changes to group DFHVTAMP

Definition	Changes made
Definitions for programs DFHCPY, DFHEXI, DFHPRK and DFHRKB	• CEDF(NO), DATALOCATION(ANY), and EXECKEY(CICS) keywords added • RSL keyword removed
Definitions for transactions CSCY, CSPK, and CSRK	• TASKDATALOC(ANY), TASKDATAKEY(CICS), and DTIMOUT(10) keywords added • EXTSEC, TRANSEC, and RSL keywords removed

DFHUAKP—Group to isolate DFHUAKP

The group DFHUAKP containing the definition for program DFHUAKP is removed because program DFHUAKP is obsolete.

New groups added in support of MRO

The are several new sample groups added to the CSD by the INITIALIZE and UPGRADE commands, designed to make it easier for you to start using MRO. In addition to sample CONNECTION and SESSIONS definitions, there are new groups for the FILEA sample programs to enable the samples to run in an MRO environment comprising a terminal-owning region (TOR), an application-owning region (AOR), and a data-owning region (DOR). Note that the sample FILEA resource definitions in DFHMROFT, DFHMROFA, and DFHMROFD define the same resources as DFH$AFLA, modified for MRO operation. The groups are:

DFHMROTR This group provides sample definitions for sessions (CICSRA), and a connection (CICA) for TOR to AOR communication.

DFHMROAR This group provides sample definitions for sessions (CICSRT and CICSRD) and connections (CICT and CICD) for AOR to TOR, and AOR to DOR, communication respectively.

DFHMRODR This group provides sample definitions for sessions (CICSRA), and a connection (CICA) for DOR to AOR communication.

DFHMROFT	This group provides the remote transaction definitions for the FILEA sample application.
DFHMROFA	This group provides the file, program, map set, and transaction definitions for the FILEA sample application. The file (FILEA) is defined as remote, and the transactions as local.
DFHMROFD	This group provides the local file resource definition for the FILEA sample application.

Group lists – DFHLIST

List DFHLIST2 no longer exists. The groups that belonged to it are merged into DFHLIST.

Changes to IBM-supplied TYPETERM definitions

Table 94. Changes to group DFHTYPE	
Definition	**Changes made**
DFHLU2M2, DFHLU2M3, DFHLU2M4, and DFHLU2M5,	The value on the SENDSIZE keyword changes from 1536 to 3840
DFHLU2E5	New. Definition LU2 SNA 3270 Model 5 device

Changes to IBM-supplied model terminal definitions for autoinstall, DFHTERM

Table 95. Changes to group DFHTERM	
Definition	**Changes made**
Definition for L2E5	New. Terminal definition LU2 SNA 3270 Model 5 devices

Appendix C. The macro API and its command-level equivalent

The following tables document the command-level equivalents for the various CICS macros.

DFHBIF macros

Table 96. DFHBIF macros and their command-level equivalents	
Macro	**Command**
DFHBIF TYPE=BITEST	No equivalent
DFHBIF TYPE=BITFLIP	No equivalent
DFHBIF TYPE=BITSETOFF	No equivalent
DFHBIF TYPE=BITSETON	No equivalent
DFHBIF TYPE=DEEDIT	BIF DEEDIT
DFHBIF TYPE=DEFLDNM	No equivalent
DFHBIF TYPE=FVERIFY	No equivalent
DFHBIF TYPE=INFORMAT	No equivalent
DFHBIF TYPE=PHONETIC	No equivalent
DFHBIF TYPE=TSEARCH	No equivalent
DFHBIF TYPE=WTRETCHK	No equivalent
DFHBIF TYPE=WTRETGET	No equivalent
DFHBIF TYPE=WTRETREL	No equivalent
DFHBIF TYPE=WTRETST	No equivalent
DFHBIF TYPE=WTRTPARM	No equivalent

DFHBMS macros

Table 97 (Page 1 of 2). DFHBMS macros and their command-level equivalents	
Macro	**Command**
DFHBMS TYPE=CHECK	HANDLE CONDITION
DFHBMS TYPE=IN	RECEIVE MAP
DFHBMS TYPE=MAP	RECEIVE MAP FROM
DFHBMS TYPE=OUT	SEND TEXT
DFHBMS TYPE=OUT,MAP=	SEND MAP
DFHBMS TYPE=PAGEBLD	SEND MAP ACCUM
DFHBMS TYPE=PAGEOUT	SEND PAGE
DFHBMS TYPE=PURGE	PURGE MESSAGE
DFHBMS TYPE=RETURN	SEND {MAP|TEXT} PAGING
DFHBMS TYPE=ROUTE	ROUTE
DFHBMS TYPE=STOREN	SEND {MAP|TEXT} PAGING

Table 97 (Page 2 of 2). DFHBMS macros and their command-level equivalents	
Macro	**Command**
DFHBMS TYPE=TEXTBLD	SEND TEXT ACCUM

DFHDC macros

Table 98. DFHDC macros and their command-level equivalents	
Macro	**Command**
DFHDC TYPE=CICS	DUMP TABLES
DFHDC TYPE=COMPLETE	DUMP COMPLETE
DFHDC TYPE=PARTIAL, LIST=PROGRAM	DUMP PROGRAM
DFHDC TYPE=PARTIAL, LIST=TERMINAL	DUMP TERMINAL
DFHDC TYPE=PARTIAL,LIST=TRANSACTION	DUMP STORAGE
DFHDC TYPE=PARTIAL, LIST=SEGMENT	DUMP FROM
DFHDC TYPE=TRANSACTION	DUMP [TASK]

DFHDI macros

Table 99. DFHDI macros and their command-level equivalents	
Macro	**Command**
DFHDI TYPE=ABORT	ISSUE ABORT
DFHDI TYPE=ADD	ISSUE ADD
DFHDI TYPE=CHECK	HANDLE CONDITION
DFHDI TYPE=END	ISSUE END
DFHDI TYPE=ERASE	ISSUE ERASE
DFHDI TYPE=NOTE	ISSUE NOTE
DFHDI TYPE=QUERY	ISSUE QUERY
DFHDI TYPE=RECEIVE	ISSUE RECEIVE
DFHDI TYPE=REPLACE	ISSUE REPLACE
DFHDI TYPE=SEND	ISSUE SEND
DFHDI TYPE=WAIT	ISSUE WAIT

DFHFC macros

Table 100 (Page 1 of 2). DFHFC macros and their command-level equivalents	
Macro	**Command**
DFHFC TYPE=CHECK	HANDLE CONDITION
DFHFC TYPE=DELETE	DELETE RIDFLD
DFHFC TYPE=ESETL	ENDBR
DFHFC TYPE=GET	READ

Table 100 (Page 2 of 2). DFHFC macros and their command-level equivalents	
Macro	**Command**
DFHFC TYPE=GET TYPOPER=UPDATE	READ UPDATE
DFHFC TYPE=GETAREA	No equivalent
DFHFC TYPE=GETNEXT	READNEXT
DFHFC TYPE=GETPREV	READPREV
DFHFC TYPE=PUT TYPOPER=DELETE	DELETE
DFHFC TYPE=PUT TYPOPER=NEWREC	WRITE
DFHFC TYPE=PUT TYPOPER=UPDATE	REWRITE
DFHFC TYPE=RELEASE	UNLOCK
DFHFC TYPE=RESETL	RESETBR
DFHFC TYPE=SETL	STARTBR

DFHIC macros

Table 101. DFHIC macros and their command-level equivalents	
Macro	**Command**
DFHIC TYPE=CANCEL	CANCEL
DFHIC TYPE=CHECK	HANDLE CONDITION
DFHIC TYPE=GET	RETRIEVE
DFHIC TYPE=GETIME	ASKTIME
DFHIC TYPE=INITIATE	START
DFHIC TYPE=POST	POST
DFHIC TYPE=PUT	START FROM
DFHIC TYPE=RETRY	RETRIEVE
DFHIC TYPE=WAIT	DELAY

DFHJC macros

Table 102 (Page 1 of 2). DFHJC macros and their command-level equivalents	
Macro	**Command**
DFHJC TYPE=CHECK	HANDLE CONDITION
DFHJC TYPE=CLOSE	SET JOURNALNUM CLOSED
DFHJC TYPE=GETB [1]	No equivalent
DFHJC TYPE=GETF [1]	No equivalent
DFHJC TYPE=GETJCA [2]	No equivalent
DFHJC TYPE=NOTE [1]	No equivalent
DFHJC TYPE=OPEN	SET JOURNALNUM OPEN

Table 102 (Page 2 of 2). DFHJC macros and their command-level equivalents	
Macro	**Command**
DFHJC TYPE=POINT	No equivalent **1**
DFHJC TYPE=PUT	JOURNALNUM WAIT
DFHJC TYPE=WAIT	WAIT JOURNALNUM
DFHJC TYPE=WRITE	WRITE JOURNALNUM

Notes

1 Online reading of journal data sets is not supported. The only way to read a CICS journal is via a suitable batch program.

2 No longer required because of simplified journal opening.

DFHKC macros

Table 103. DFHKC macros and their command-level equivalents	
Macro	**Command**
DFHKC TYPE=ATTACH **1**	No equivalent
DFHKC TYPE=CHAP	CHANGE TASK PRIORITY
DFHKC TYPE=DEQ	DEQ
DFHKC TYPE=ENQ	ENQ
DFHKC TYPE=NOPURGE	No equivalent
DFHKC TYPE=PURGE	No equivalent
DFHKC TYPE=WAIT,DCI=CICS	WAIT EVENT
DFHKC TYPE=WAIT,DCI=DISP	SUSPEND
DFHKC TYPE=WAIT,DCI=LIST	WAIT EXTERNAL, WAITCICS
DFHKC TYPE=WAIT,ECADDR=	WAIT EVENT

Notes

1 EXEC CICS START may be used; modifications may be required to programs invoked by the started transaction.

DFHOC macros

Table 104. DFHOC macros and their command-level equivalents	
Macro	**Command**
DFHOC TYPE=CLOSE	• SET DUMP CLOSED • SET FILE CLOSED • SET TDQUEUE CLOSED
DFHOC TYPE=OPEN	• SET DUMP OPEN • SET FILE OPEN • SET TDQUEUE OPEN
DFHOC TYPE=SWITCH	SET DUMP SWITCH

DFHPC macros

Table 105. DFHPC macros and their command-level equivalents

Macro	Command
DFHPC TYPE=ABEND	ABEND
DFHPC TYPE=CHECK	HANDLE CONDITION
DFHPC TYPE=COBADDR	No equivalent
DFHPC TYPE=DELETE	RELEASE
DFHPC TYPE=LINK	LINK
DFHPC TYPE=LOAD	LOAD
DFHPC TYPE=RESETXIT	HANDLE ABEND RESET
DFHPC TYPE=SETXIT	HANDLE ABEND
DFHPC TYPE=XCTL	XCTL

DFHSC macros

Table 106. DFHSC macros and their command-level equivalents

Macro	Command
DFHSC TYPE=FREEMAIN	FREEMAIN
DFHSC TYPE=GETMAIN	GETMAIN

DFHSP macros

Table 107. DFHSP macros and their command-level equivalents

Macro	Command
DFHSP TYPE=USER	SYNCPOINT
DFHSP TYPE=ROLLBACK	SYNCPOINT ROLLBACK

DFHTC macros

Table 108 (Page 1 of 2). DFHTC macros and their command-level equivalents

Macro	Command
DFHTC CTYPE=CHECK	HANDLE CONDITION
DFHTC CTYPE=COMMAND	No equivalent
DFHTC CTYPE=LOCATE	• INQUIRE CONNECTION • INQUIRE TERMINAL
DFHTC CTYPE=STATUS	SET TERMINAL
DFHTC TYPE=CBUFF	No equivalent — BTAM only
DFHTC TYPE=CONVERSE	CONVERSE
DFHTC TYPE=COPY	ISSUE COPY
DFHTC TYPE=DISCONNECT	ISSUE DISCONNECT

Table 108 (Page 2 of 2). DFHTC macros and their command-level equivalents	
Macro	**Command**
DFHTC TYPE=EODS	ISSUE EODS
DFHTC TYPE=ERASEUP	ISSUE ERASEUP
DFHTC TYPE=GET	RECEIVE
DFHTC TYPE=PAGE	No equivalent
DFHTC TYPE=PASSBK	SEND PASSBK
DFHTC TYPE=PRINT	ISSUE PRINT
DFHTC TYPE=PROGRAM	ISSUE LOAD
DFHTC TYPE=PUT	SEND WAIT
DFHTC TYPE=READ	RECEIVE (WAIT assumed)
DFHTC TYPE=READB	RECEIVE BUFFER
DFHTC TYPE=READL	RECEIVE LEAVEKB
DFHTC TYPE=RESET	ISSUE RESET
DFHTC TYPE=SIGNAL	WAIT SIGNAL
DFHTC TYPE=WAIT	WAIT TERMINAL
DFHTC TYPE=WRITE	SEND
DFHTC TYPE=WRITEL	SEND LEAVEKB

DFHTD macros

Table 109. DFHTD macros and their command-level equivalents	
Macro	**Command**
DFHTD TYPE=CHECK	HANDLE CONDITION
DFHTD TYPE=FEOV	No equivalent
DFHTD TYPE=GET	READQ TD
DFHTD TYPE=PURGE	DELETEQ TD
DFHTD TYPE=PUT	WRITEQ TD

DFHTR macros

Table 110. DFHTR macros and their command-level equivalents	
Macro	**Command**
DFHTR TYPE=ENTRY	ENTER
DFHTR TYPE=OFF	TRACE OFF
DFHTR TYPE=ON	TRACE ON

DFHTS macros

Table 111. DFHTS macros and their command-level equivalents	
Macro	**Command**
DFHTS TYPE=CHECK	HANDLE CONDITION
DFHTS TYPE=GET	READQ TS **1**
DFHTS TYPE=GETQ	READQ TS
DFHTS TYPE=PURGE	DELETEQ TS
DFHTS TYPE=PUT **1**	WRITEQ TS
DFHTS TYPE=PUTQ	WRITEQ TS
DFHTS TYPE=RELEASE **1**	DELETEQ TS

Notes:

1 These macros handle single items rather than queues. The mapping from macro to command level is not always be one-to-one.

DFHWOSM macros

The following DFHWOSM macros do not have command-level equivalents. They invoke the CICS module, DFHWOS, in a batch environment, to provide the services to the XRF overseer program:

- DFHWOSM FUNC=BUILD
- DFHWOSM FUNC=CLOSE
- DFHWOSM FUNC=DSECT
- DFHWOSM FUNC=JJC
- DFHWOSM FUNC=JJS
- DFHWOSM FUNC=OPEN
- DFHWOSM FUNC=OSCMD
- DFHWOSM FUNC=QJJS
- DFHWOSM FUNC=READ
- DFHWOSM FUNC=TERM

Bibliography

CICS Transaction Server for VSE/ESA Release 1 library

Evaluation and planning	
Release Guide	GC33-1645
Migration Guide	GC33-1646
Report Controller Planning Guide	SC33-1941

General	
Master Index	SC33-1648
Trace Entries	SC34-5556
User's Handbook	SX33-6101
Glossary (softcopy only)	GC33-1649

Administration	
System Definition Guide	SC33-1651
Customization Guide	SC33-1652
Resource Definition Guide	SC33-1653
Operations and Utilities Guide	SC33-1654
CICS-Supplied Transactions	SC33-1655

Programming	
Application Programming Guide	SC33-1657
Application Programming Reference	SC33-1658
Sample Applications Guide	SC33-1713
Application Migration Aid Guide	SC33-1943
System Programming Reference	SC33-1659
Distributed Transaction Programming Guide	SC33-1661
Front End Programming Interface User's Guide	SC33-1662

Diagnosis	
Problem Determination Guide	GC33-1663
Messages and Codes Vol 3 (softcopy only)	SC33-6799
Diagnosis Reference	LY33-6085
Data Areas	LY33-6086
Supplementary Data Areas	LY33-6087

Communication	
Intercommunication Guide	SC33-1665
CICS Family: Interproduct Communication	SC33-0824
CICS Family: Communicating from CICS on System/390	SC33-1697

Special topics	
Recovery and Restart Guide	SC33-1666
Performance Guide	SC33-1667
Shared Data Tables Guide	SC33-1668
Security Guide	SC33-1942
External CICS Interface	SC33-1669
XRF Guide	SC33-1671
Report Controller User's Guide	SC33-1940

CICS Clients	
CICS Clients: Administration	SC33-1792
CICS Universal Clients Version 3 for OS/2: Administration	SC34-5450
CICS Universal Clients Version 3 for Windows: Administration	SC34-5449
CICS Universal Clients Version 3 for AIX: Administration	SC34-5348
CICS Universal Clients Version 3 for Solaris: Administration	SC34-5451
CICS Family: OO programming in C++ for CICS Clients	SC33-1923
CICS Family: OO programming in BASIC for CICS Clients	SC33-1671
CICS Family: Client/Server Programming	SC33-1435
CICS Transaction Gateway Version 3: Administration	SC34-5448

5

5 Books from VSE/ESA 2.4 base program libraries

5 VSE/ESA Version 2 Release 4

5	Book title	Order number
5	Administration	SC33-6705
5	Diagnosis Tools	SC33-6614
5	Extended Addressability	SC33-6621
5	Guide for Solving Problems	SC33-6710
5	Guide to System Functions	SC33-6711
5	Installation	SC33-6704
5	Licensed Program Specification	GC33-6700
5	Messages and Codes Volume 1	SC33-6796
5	Messages and Codes Volume 2	SC33-6798
5	Messages and Codes Volume 3	SC33-6799
5	Networking Support	SC33-6708
5	Operation	SC33-6706
5	Planning	SC33-6703
5	Programming and Workstation Guide	SC33-6709
5	System Control Statements	SC33-6713
5	System Macro Reference	SC33-6716
5	System Macro User's Guide	SC33-6715
5	System Upgrade and Service	SC33-6702
5	System Utilities	SC33-6717
5	TCP/IP User's Guide	SC33-6601
5	Turbo Dispatcher Guide and Reference	SC33-6797
5	Unattended Node Support	SC33-6712

5 High-Level Assembler Language (HLASM)

5	Book title	Order number
5	General Information	GC26-8261
5	Installation and Customization Guide	SC26-8263
5	Language Reference	SC26-8265
5	Programmer's Guide	SC26-8264

5 Language Environment for VSE/ESA (LE/VSE)

Book title	Order number
C Run-Time Library Reference	SC33-6689
C Run-Time Programming Guide	SC33-6688
Concepts Guide	GC33-6680
Debug Tool for VSE/ESA Fact Sheet	GC26-8925
Debug Tool for VSE/ESA Installation and Customization Guide	SC26-8798
Debug Tool for VSE/ESA User's Guide and Reference	SC26-8797
Debugging Guide and Run-Time Messages	SC33-6681
Diagnosis Guide	SC26-8060
Fact Sheet	GC33-6679
Installation and Customization Guide	SC33-6682
LE/VSE Enhancements	SC33-6778
Licensed Program Specification	GC33-6683
Programming Guide	SC33-6684
Programming Reference	SC33-6685
Run-Time Migration Guide	SC33-6687
Writing Interlanguage Communication Applications	SC33-6686

5 VSE/ICCF

Book title	Order number
Adminstration and Operations	SC33-6738
User's Guide	SC33-6739

5 VSE/POWER

Book title	Order number
Administration and Operation	SC33-6733
Application Programming	SC33-6736
Networking Guide	SC33-6735
Remote Job Entry User's Guide	SC33-6734

5 VSE/VSAM

Book title	Order number
Commands	SC33-6731
User's Guide and Application Programming	SC33-6732

Book title	Order number
Customization	LY43-0063
Diagnosis	LY43-0065
Data Areas	LY43-0104
Messages and Codes	SC31-6493
Migration Guide	GC31-8072
Network Implementation Guide	SC31-6494
Operation	SC31-6495
Overview	GC31-8114
Programming	SC31-6496
Programming for LU6.2	SC31-6497
Release Guide	GC31-8090
Resource Definition Reference	SC31-6498

Books from VSE/ESA 2.4 optional program libraries

C for VSE/ESA (C/VSE)

Book title	Order number
C Run-Time Library Reference	SC33-6689
C Run-Time Programming Guide	SC33-6688
Diagnosis Guide	GC09-2426
Installation and Customization Guide	GC09-2422
Language Reference	SC09-2425
Licensed Program Specification	GC09-2421
Migration Guide	SC09-2423
User's Guide	SC09-2424

COBOL for VSE/ESA (COBOL/VSE)

Book title	Order number
Debug Tool for VSE/ESA Fact Sheet	GC26-8925
Debug Tool for VSE/ESA Installation and Customization Guide	SC26-8798
Debug Tool for VSE/ESA User's Guide and Reference	SC26-8797
Diagnosis Guide	SC26-8528
General Information	GC26-8068
Installation and Customization Guide	SC26-8071
Language Reference	SC26-8073
Licensed Program Specifications	GC26-8069
Migration Guide	GC26-8070
Migrating VSE Applications To Advanced COBOL	GC26-8349
Programming Guide	SC26-8072

DB2 Server for VSE

Book title	Order number
Application Programming	SC09-2393
Database Administration	GC09-2389
Installation	GC09-2391
Interactive SQL Guide and Reference	SC09-2410
Operation	SC09-2401
Overview	GC08-2386
System Administration	GC09-2406

DL/I VSE

Book title	Order number
Application and Database Design	SH24-5022
Application Programming: CALL and RQDLI Interface	SH12-5411
Application Programming: High-Level Programming Interface	SH24-5009
Database Administration	SH24-5011
Diagnostic Guide	SH24-5002
General Information	GH20-1246
Guide for New Users	SH24-5001
Interactive Resource Definition and Utilities	SH24-5029
Library Guide and Master Index	GH24-5008
Licensed Program Specifications	GH24-5031
Low-level Code and Continuity Check Feature	SH20-9046
Library Guide and Master Index	GH24-5008
Messages and Codes	SH12-5414
Recovery and Restart Guide	SH24-5030
Reference Summary: CALL Program Interface	SX24-5103
Reference Summary: System Programming	SX24-5104
Reference Summary: HLPI Interface	SX24-5120
Release Guide	SC33-6211

PL/I for VSE/ESA (PL/I VSE)

Book title	Order number
Compile Time Messages and Codes	SC26-8059
Debug Tool For VSE/ESA User's Guide and Reference	SC26-8797
Diagnosis Guide	SC26-8058
Installation and Customization Guide	SC26-8057
Language Reference	SC26-8054
Licensed Program Specifications	GC26-8055
Migration Guide	SC26-8056
Programming Guide	SC26-8053
Reference Summary	SX26-3836

Screen Definition Facility II (SDF II)

Book title	Order number
VSE Administrator's Guide	SH12-6311
VSE General Introduction	SH12-6315
VSE Primer for CICS/BMS Programs	SH12-6313
VSE Run-Time Services	SH12-6312

Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply in the United Kingdom or any other country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact IBM United Kingdom Laboratories, MP151, Hursley Park, Winchester, Hampshire, England, SO21 2JN. Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Programming License Agreement, or any equivalent agreement between us.

Trademarks and service marks

The following terms, used in this publication, are trademarks or service marks of IBM Corporation in the United States or other countries:

ACF/VTAM	AD/Cycle	APL2
AS/400	AT	C/370
CICS	CICS/ESA	CICS OS/2
CICS/VSE	CICS/400	CICS/6000
Database 2	DB2	Enterprise System Architecture/390
ES/3090	ES/4381	ES/9370
ES/9000	ESA/390	GDDM
IBM	IMS	IMS/ESA
Language Environment	MVS/ESA	NetView
Operating System/2	Personal System/2	PSF
PS/2	RETAIN	RMF
RT	RT PC	S/370
SAA	Selectric	Series/1
SQL/DS	SP	System/36
System/38	System/370	System/390
System/88	VSE/ESA	VTAM
3090		

Index

Special Characters

&DFHEIMX symbol
obsolete global   122

A

abend codes
programs that use   139
abend trace   197
access methods   14
ACEE, access control environment element   122
ADDRESS CSA command   121
Advanced Function (AFD) printers   13
AOR, cutting over   8
APPC (LU6.2) session security   174
APPC commands   41
Application Migration Aid   118
application programming interface   121
assembler support   116
assemblers   116
autoinstall
DFHZATDX, sample user program   152
DFHZCTDX, sample user program   152
DFHZDTDX, sample user program   152
DFHZPTDX, sample user program   152
automatic journal archiving data sets   79
auxiliary trace   199
auxiliary trace data sets
sending trace to   69
setting the size of   198
switching options   162
using CETR and CEMT to define   164

B

basic mapping support (BMS)
See BMS (basic mapping support)
Basic Telecommunications Access Method (BTAM)
See BTAM (Basic Telecommunications Access
Method)
batch data interchange program
See DFHDIP, batch data interchange program
BMS (basic mapping support)
BMS mapsets   121
BMS partition sets   121
command-level equivalents for BMS macros   249
CURSLOC attribute, new   121
cursor location, testing for   121
DFHBMS, group, changes to   234
book objectives   ix
BSM (basic security manager)   167

BTAM (Basic Telecommunications Access Method)
discontinued support   12
terminals   23, 30, 32

C

C/370 programming language
catalogs, local and global   79
CAVM (CICS availability manager)
change to record format   192
using overseer programs with   192
CDSA   57
CEBT transaction, changes to   162
CEDA transaction
CEDA transaction, changes to   162
CEDF transaction
constraints for remote transactions   196
dual screen mode   163
support for remote transactions   195
CEMT, master terminal transaction
changed commands   158
new commands   156
central functions component   11
CEOT transaction, changes to   163
CESF, signoff transaction
changes to   155
security at signoff   172
CESN, signon transaction
changes to   163
security at signon   172
CETR transaction   199
new trace command   156
CICS availability manager (CAVM)
See CAVM (CICS availability manager)
CICS default user, security   173
CICS spooler interface, API enhancements   13
CICS system definition (CSD) file
See CSD (CICS system definition file)
CICS-supplied transactions, new   155
COBOL programming language
DOS/VS COBOL compiler   15
VS COBOL II compiler   15
coexistence
introduction   4
strategies   29
command security checking   180
command-level programming
ADDRESS ACEE   122
ADDRESS CSA   121
CALL DL/I interface   123
EXEC DLI commands   123
obsolete commands   129

dynamic storage area (DSA)
    See DSA (dynamic storage area)
dynamic transaction backout (DTB)
    See DTB (dynamic transaction backout)
dynamic transaction routing program, DFHDYP   153

E
ECDSA   57
EDF (execution diagnostic facility)
    changes to   196
    constraints with remote transactions   196
    support in debugging   195
EDSALIM, system initialization parameter   57
EIBAID   126
emergency restart
    deleting autoinstall entries   68
    handling CSD entries   81
    recovering file resource definitions   69
    system log processing   79
emulation modes, OS390 parameter   4
ERDSA   57
ESDSA   57
EUDSA   57
exception trace   199
EXEC CICS ADDRESS ACEE command   122
execution diagnostic facility (EDF)
    See EDF (execution diagnostic facility)
exit programming interface (XPI)   148
exit-handling changes   142
exits
    exit-handling, changed   142
    EXITS system initialization parameter, obsolete   142
    obsolete exits   147
    PLT, new initialization phase   142
    summary of all exits   142
    summary of changes to GLUEs   141
    task-related, changes to   150
    TBEXITS system initialization parameter, new   142
    XPI for CICS services   148
extended recovery facility
    See XRF (extended recovery facility)
extended storage usage
    virtual storage constraint relief   56
external security
    DFLTUSER system initialization parameter   173

F
Fast service upgrade (FSU)   19
FCT (file control table)
    reassembling file control tables   88
file control table (FCT)
    See FCT (file control table)
FILE definition, description   94

FSU (Fast service upgrade)   19

G
GCD, global catalog data set   79
GDDM applications   18
global catalog data set (GCD)   79

H
hardware prerequisites   11

I
ICVS, system initialization parameter   61
II, VSE/ESA Interactive Interface
    See VSE/ESA Interactive Interface (II)
initialization parameters and overrides   67
INSTALL command, changes to   92
installation
    CICS for VSE/ESA Version 2.3, using the II   21
    fast service upgrade (FSU)   19
    other considerations   19
    PTFs and APARs   19
    SVA modules   19
installation phase, migration strategy   8
integrity improvements   51
Interactive Computing and Control facility (ICCF)   11
interface improvements   51
interface to master terminal, programmable   138
internal trace table   199
interpreting monitoring data   220
interregion communication (IRC)
    See IRC (interregion communication)
intersystem communication (ISC)
    See ISC (intersystem communication)
introduction   3
IRC (interregion communication)
    devices connected using BTAM   12
    level of DFHIRP   20
    migration and coexistence   34
ISC (intersystem communication)
    APPC   41
    backout-required condition   46
    CICS LU6.2 implementation changes   41
    conversation state after rollback   44
    conversation STATE option   45
    DTP, distributed transaction processing   41
    migrating in an MRO/ISC environment   34
    negative response to SYNCPOINT   43
    PROCNAME extended   45
    removal of deferred data   42
    requirements   16
    return data and status on RECEIVE   45
    timely receipt of responses   42
    two adjacent syncpoints   43

J

job step return codes   212
journal data sets, automatic archiving   79
journaling, command-level equivalents for JC
  macros   251

K

key migration tasks   3

L

Language Environment for VSE/ESA   15
languages supported   15
LCD, local catalog data set   79
link security user ID   175
loader programs   139
local catalog data set (LCD)   79
LSRPOOL definition   94
LU6.2
   APPC session security   174
   changes to implementation   41
   Exchange Log Names flow   44
   response to syncpoint   43

M

macro-level application programs, support for   117
macros
   DFHDCT macro   105
   DFHEICAL, discontinued   122
   DFHEIMX, discontinued   122
   DFHFCT macro   107
   DFHMCT macro   108
   DFHPCT macros, obsolete   109
   DFHPLT macros, changes to   110
   DFHPPT macros, obsolete   110
   DFHSNT macros, obsolete   111
   DFHTCT macro   111
MAPSET definition, changes to   95
MCT (monitoring control table)
   DFHMCT, macro changes   108
messages
   abend code inserts   210
   action codes   207
   automated operations   212
   dumps   210
   format of information   208
   message domain   205
   route codes   209
   severity codes   208
   terminal identifiers   210
   types of messages produces   205
   XMEOUT global user exit   211
   XMEOUT parameters   209

migration
   AOR, cutting over   8
   applications that cannot be migrated   9
   developing a migration strategy   5
   DOR, cutting over   8
   installation phase   8
   migration strategy, an example   5
   paths   11
   phased cutover   8
   phased cutover, migration strategy   8
   planning and control   5
   positioning phase   7
   regions that cannot be migrated   9
   single-region systems, cutting over   9
   strategy   8
   tasks   3
   TOR, cutting over   8
MN system initialization parameter   218
MNCONV system initialization parameter   218
MNEXC system initialization parameter   218
MNFREQ system initialization parameter   218
MNPER system initialization parameter   218
MNSYNC system initialization parameter   218
MNTIME system initialization parameter   218
monitoring
   ACCOUNT option, obsolete   219
   CEMT INQUIRE and SET MONITOR
     transactions   219
   collection types   217
   CSTT transaction, obsolete   219
   DFHMCT macro changes   219
   dumps   219
   exception class records   217
   EXEC CICS INQUIRE and SET MONITOR
     commands   219
   MN domain   217
   MN system initialization parameter   218
   MNCONV system initialization parameter   218
   MNEXC system initialization parameter   218
   MNFREQ system initialization parameter   218
   MNPER system initialization parameter   218
   MNSYNC system initialization parameter   218
   MNTIME system initialization parameter   218
   performance class records   217
   programs for analyzing   138
   system initialization parameters   218
   tracing   218
   XMNOUT, global user exit   218
monitoring control table (MCT)
   See MCT (monitoring control table)
monitoring data, interpreting   220
MRO (multiregion operation)
   DFHACEE, obsolete   28
   DFHIRP, migrating to CICS TS Release 1 level
     of   27
   duplicate NETNAMEs, prohibited   93

Sending your comments to IBM

CICS® Transaction Server for VSE/ESA™

Migration Guide

GC33-1646-00

If you want to send to IBM any comments you have about this book, please use one of the methods listed below. Feel free to comment on anything you regard as a specific error or omission in the subject matter, and on the clarity, organization or completeness of the book itself.

To request additional publications, or to ask questions or make comments about the functions of IBM products or systems, you should talk to your IBM representative or to your IBM authorized remarketer.

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate, without incurring any obligation to you.

You can send your comments to IBM in any of the following ways:

- By mail:

        IBM UK Laboratories
        Information Development
        Mail Point 095
        Hursley Park
        Winchester, SO21 2JN
        England

- By fax:

    – From outside the U.K., after your international access code use 44 1962 870229
    – From within the U.K., use 01962 870229

- Electronically, use the appropriate network ID:

    – IBM Mail Exchange: GBIBM2Q9 at IBMMAIL
    – IBMLink: HURSLEY(IDRCF)
    – Email: idrcf@hursley.ibm.com

Whichever method you use, ensure that you include:

- The publication number and title
- The page number or topic to which your comment applies
- Your name and address/telephone number/fax number/network ID.

IBM ®