

CICS Clients



# Administration

*Version 2.0.4*



CICS Clients



# Administration

*Version 2.0.4*

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page xi.

**Fifth edition (July 1998)**

This edition applies to Version 2.0.4 of the IBM licensed programs:

- IBM CICS Client for DOS, program number 5639-001
- IBM CICS Client for OS/2, program number 5639-001
- IBM CICS Client for Windows, program number 5639-001
- IBM CICS Client for Windows 95, program number 5639-001
- IBM CICS Client for Windows NT, program number 5639-001
- IBM CICS Client for Macintosh, program number 5639-001

It will also apply to all subsequent versions, releases, and modifications until otherwise indicated in new editions. Consult the latest edition of the applicable IBM system bibliography for current information on these products.

This book is based on the *Administration* book, for CICS Clients Version 2.0.3, SC33-1792-03. Changes from that edition are marked by vertical lines to the left of the changes.

The CICS Clients Version 2.0.3 edition remains applicable and current for users of Version 2.0.3 and can still be ordered using the old order number SC33-1792-03.

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## Summary of changes

Changes to this book since the previous edition are indicated by a revision symbol to the left of the text.

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### Changes for IBM CICS Clients Version 1.1

Information has been added to the book about:

- Installing CICS clients from CICS Transaction Server for OS/2 Warp, which is one of the IBM software servers.
- Setting up client/server configuration.  
The information has been extended with definition checklists that show the definitions required to allow client/server communication using particular products and protocols.
- The information on the CICSPRNT command has been extended.
- The chapter on problem determination has been improved and extended.

---

### Changes for IBM CICS Clients Version 2.0

Information has been added to the book about:

- The new clients, CICS Client for Windows 95 and CICS Client for Windows NT
- The use of Microsoft SNA Server for APPC communication between CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT and CICS servers  
The new trace to memory function which includes:
  - New client initialization file parameters
  - New options on the CICSCLI command
- The IBM CICS Clients library, including how to view online information, and how to print and order books

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### Changes for IBM CICS Clients Version 2.01

Information has been added to the book about:

- The font selection function of the terminal emulators of CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT
- The CICSTERP command of CICS Client for DOS
- The addition of the CICS Internet gateway component to CICS Client for Windows NT
- Running CICS Client for Windows NT as a Windows NT service.

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## Changes for IBM CICS Clients Version 2.02

Information has been added to the book about:

- The support for the IBM TCP62 protocol in CICS Client for Windows NT and CICS Client for Windows 95
- The support for Distributed Computing Environment (DCE) in CICS Client for Windows NT
- The use of IBM Personal Communications with CICS Client for Windows NT and CICS Client for Windows 95
- The use of IBM Communications Server with CICS Client for Windows NT and CICS Client for Windows 95
- The changes to the configuration of Client Access/400 for Windows 3.1.
- The configuration of NetWare for SAA Version 2.2
- The IBM CICS Gateway for Java.

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## Changes for IBM CICS Clients Version 2.03

Information has been added to the book about:

- The support for the IBM TCP62 protocol in CICS Client for OS/2
- The configuration of Novell NetWare for SAA with CICS Client for Windows NT and CICS Client for Windows 95
- The client initialization file parameters ApiTrace and LUAliasNames
- The changes to keyboard mapping for CICS Client for Windows, CICS Client for Windows NT, and CICS Client for Windows 95
- Support for tn3270 terminals to connect to CICS servers
- The support for the IBM CICS Gateway for Java Version 2.

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## Changes for IBM CICS Clients Version 2.04

Information has been added to “Setting up security” on page 178 about password management enhancements.

For CICS Client for OS/2 communicating over APPC using Communications Manager/2, it is no longer necessary to provide a transaction program (TP) definition for the CRSR transaction. The associated information has been removed from “APPC configuration” on page 94.

More information has been added to “CICS Client telnet terminal support” on page 202.



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## Preface

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### What this book is about

This book contains the following chapters:

- Chapter 1 introduces the IBM CICS Clients and summarizes the benefits of using them, and the functions they provide.
- Chapter 2 discusses the various ways in which CICS clients can be connected to CICS servers. It also lists the hardware, software and communication protocols required.
- Chapter 3 describes how to install your CICS clients.
- Chapter 4 summarizes how to set up your CICS clients for communication with CICS servers.
- Chapter 5 describes how to prepare the client initialization file. This chapter also describes how to customize your CICS clients by remapping the keyboard and tailoring the 3270 screen color attributes.
- Chapter 6 describes how to use the facilities supplied with CICS clients to control the client process, 3270 terminal emulation, and client printer support.
- Chapter 7 describes the support for Distributed Computing Environment (DCE) in CICS clients.
- Chapter 8 describes problem determination for CICS clients. This chapter describes CICS clients trace and error processing, and discusses communication problems and how to deal with them.
- Chapter 9 describes how to install and distribute CICS Client for OS/2 around your network.
- Chapter 10 discusses migrating from using CICS for OS/2 Distributed Feature clients to using IBM CICS Clients.
- Appendix A describes how to view the online information in the CICS clients library, and how to print and order books.

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### Who this book is for

This book is intended for anyone involved with the planning, installation, customization, or operation of an IBM CICS Clients system.

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### What you need to know to understand this book

It is assumed that you are familiar with the operating system under which your CICS clients run.

## Preface

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### How to use this book

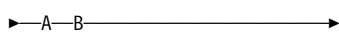

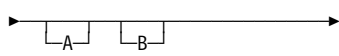
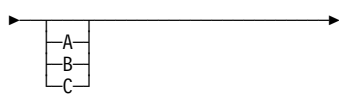
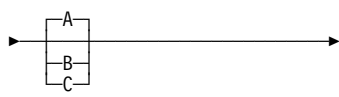
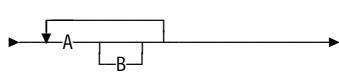
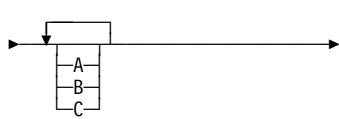
Use this book according to the task you must perform:

- **To get an overview of CICS clients**, read Chapter 1.
- **To plan for the implementation of your CICS clients**, read Chapter 2.
- **To install your CICS clients**, work through Chapter 3.
- **To set up your CICS clients for communication with a CICS server**, read Chapter 4.
- **To customize your CICS clients**, read Chapter 5.
- **To control client operation**, read Chapter 6.
- **To understand the DCE support provided by CICS clients**, read Chapter 7.
- **To perform problem determination**, read Chapter 8.
- **To distribute CICS Client for OS/2 around your network**, read Chapter 9.
- **To migrate from using CICS for OS/2 Distributed Feature clients to using IBM CICS Clients**, read Chapter 10
- **To get an overview of the CICS clients library**, read Appendix A.

## Command syntax

In this book the syntax of commands is shown in a standard way. This syntax, commonly known as *railroad* syntax, is described in Table 1. You interpret the syntax by following the arrows from left to right, and from top to bottom, along the main path line.

Table 1. Command syntax conventions

Symbol	Meaning
	Required items appear on the main path line.
	If there is more than one required item to choose from, the items are stacked vertically. This is a set of alternatives—one of which you <i>must</i> specify.
	Optional items appear below the main path line.
	If there is more than one optional item to choose from, the items are stacked vertically below the main path line. This is a set of alternatives—one of which you may specify.
	If one item in a set of alternatives is the default, this item appears above the main path line and all other items are stacked vertically below the line.
	An arrow returning to the left above items on the main path line means that the items can be repeated. Such items may be either required or optional.
	An arrow returning to the left above a set of items means that more than one item can be selected or that a single item can be repeated. <b>Note:</b> For CICS, unless otherwise stated, this representation means only that more than one item can be selected.
Punctuation and uppercase characters	Code exactly as shown.
Lowercase characters appearing like <i>this</i>	Code your own text, as appropriate. For example, with FILE( <i>name</i> ) you must specify FILE and () unchanged, but are free to specify any valid text string for the name of your file.

## Preface

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### Notes on terminology

A glossary is provided at the back of this book.

CICS clients supports the use of the C, C++, COBOL, PL/I, and REXX programming languages (see “Software requirements” on page 24).

For simplicity, ‘C’ is used to refer to both the C and C++ languages throughout this book.

In this book, ‘CICS on Open Systems’ is used to refer to the following products, subject to availability:

- CICS for AIX
- CICS for HP-UX
- CICS for Digital UNIX
- CICS for Siemens-Nixdorf SINIX
- CICS for Sun Solaris

‘CICS Client for Windows Family’ refers to CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT collectively. Similarly, ‘Windows Family’ refers to the Windows 3.x, Windows 95, and Windows NT operating systems collectively.

---

### Publications

The following sections list books relevant to CICS clients.

#### IBM CICS Clients publications

The following book describes the programming interfaces associated with CICS client/server programming—the External Call Interface (ECI), and the External Presentation Interface (EPI):

*CICS Family: Client/Server Programming*, SC33-1435

The following book describes how to write object oriented programs for the ECI and EPI in the C++ language.

*CICS Family: OO Programming in C++ for CICS Clients*, SC33-1923

The following book describes how to write object oriented programs for the ECI and EPI in the BASIC language.

*CICS Family: OO Programming in BASIC for CICS Clients*, SC33-1924

The following book explains the error and trace messages generated by CICS clients. This book is available as an online book only.

*IBM CICS Clients Messages*, GC33-1793

The following book describes the Gateways from CICS to Lotus Notes and from CICS to the Internet that are supplied with CICS Client for OS/2 and CICS Client for Windows NT.

*IBM CICS Clients Gateways*, SC33-1821

The following book contains many examples of CICS client/server configurations:

*IBM International Technical Support Organization: CICS Clients Unmasked*, GG24-2534

#### CICS publications

The books in this section are concerned with CICS server products.

#### CICS inter-product communication

The following books describe the intercommunication facilities of the CICS server products:

*CICS Family: Inter-Product Communication*, SC33-0824

*CICS for OS/2 Intercommunication*, SC33-1583

*CICS for Windows NT: Version 2.0 Intercommunication*, SC33-1423

*CICS for Windows NT: Version 3.0 Intercommunication*, SC33-1882

*CICS/MVS Intercommunication Guide*, SC33-0519

*Communicating from CICS for MVS/ESA and CICS/VSE*, SC33-0825

## Preface

*CICS on Open Systems Intercommunication, SC33-0827*

*CICS/400: Intercommunication, SC33-1388*

The first book above is a CICS family book containing a platform-independent overview of CICS inter-product communication.

### **CICS problem determination books**

The following books describe the problem determination facilities of the CICS server products:

*CICS for OS/2 Problem Determination, SC33-1584*

*CICS for Windows NT: Version 2.0 Problem Determination, SC33-1424*

*CICS for Windows NT: Version 3.0 Problem Determination, SC33-1883*

*CICS/MVS Problem Determination Guide, SC33-0516*

*CICS for MVS/ESA Problem Determination Guide, SC33-1176*

*CICS/VSE Problem Determination Guide, SC33-0716*

*CICS on Open Systems Problem Determination Guide, SC33-0818*

*CICS/400: Problem Determination, SC33-1384*

You can find information on CICS products at the following Uniform Resource Locator (URL) on the World Wide Web:

<http://www.hursley.ibm.com/cics>

### **DOS publications**

The following book provides introductory material about DOS:

*DOS System Guide*

### **OS/2 publications**

The following books provide introductory material about OS/2:

*Using OS/2 Version 2*

*Presentation Manager User's Guide* (three volumes)

### **Microsoft Windows Family publications**

The following books provide introductory material about the Windows Family of operating systems:

*Windows System Guide*

*Windows NT System Guide*

*Introducing Microsoft Windows 95*

### Apple Macintosh publications

The following book provides introductory material about the Macintosh:

*Macintosh User's Guide for desktop Macintosh computers*

### NetBIOS-related publications

The following books are concerned with products providing NetBIOS.:

*Local Area Network Support Program Version 1.3 User's Guide*, SO4G-1115

*Network Transport Services/2: LAN Adapter and Protocol Support Configuration Guide*, S96F-8489

*LAN Technical Reference IEEE 802.2 and NetBIOS Application Program Interfaces*, SC30-3587

IBM Communications Manager/2 also provides NetBIOS, see "APPC-related publications"

### TCP/IP-related publications

The following books are concerned with products providing TCP/IP:

#### IBM products

*IBM Transmission Control Protocol/Internet Protocol Version 2.1.1 for DOS: Installation and Administration*, SC31-7047

*IBM Transmission Control Protocol/Internet Protocol Version 2.0 for OS/2: Installation and Administration*, SC31-6075

*IBM Transmission Control Protocol/Internet Protocol Version 2.0 for OS/2: Installation and Interoperability*, GG24-3531

*TCP/IP for MVS, VM, OS/2 and DOS Troubleshooting Guide*, GG24-3852.

#### Other vendors' products

*FTP Inc. TCP/IP Installation Guide*

*Novell LAN Workplace Installation Guide*

### APPC-related publications

The following books are concerned with products providing APPC support:

#### IBM products

*IBM APPC Networking Services for Windows: Getting Started*, SC31-8124

*IBM APPC Networking Services for Windows: Administrator's Guide*, SC31-8125

*IBM APPC Networking Services for Windows: Application Programmer's Reference*, SC31-8126

*IBM APPC Networking Services for Windows: Configuration Parameters Reference for Administrators and Application Programmers*, SC31-8138

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### **OS/2 Communications Manager/2:**

*Communications Manager/2 Version 1.1: Configuration Guide*, SC31-6171

*Communications Manager/2 Version 1.1: Workstation Installation and Configuration Guide*, SC31-7169

*Communications Manager/2 Version 1.1: Network Administration and Subsystem Management Guide*, SC31-6168

*Communications Manager/2 Version 1.1: Information and Planning Guide*, SC31-7007

*Communications Manager/2 Version 1.1: APPC Programming Guide and Reference*, SC31-6160

*Communications Manager/2 Version 1.1: Problem Determination Guide*, SC31-6156

### **Communications Server for OS/2 Warp**

*Communications Server for OS/2 Warp Version 4.1: Up and Running!*, GC31-8189

*Communications Server for OS/2 Warp Version 4.1: Network Administration and Subsystem Management Guide*, SC31-8181

*Communications Server for OS/2 Warp Version 4.1: 32-Bit APPC Programming Guide and Reference*, SC31-8148

*Communications Server for OS/2 Warp Version 4.1: Problem Determination Guide*, SC31-8186

*Communications Server for OS/2 Warp Version 4.1: Response File Reference*, SC31-8187

### **Communications Server for Windows NT**

*Communications Server for Windows NT, Up and Running!* , GC31-8424

### **IBM Personal Communications**

*IBM eNetwork Personal Communications Version 4.2 for Windows 95 and Windows NT, Quick Beginnings*, GC31-8476

*IBM eNetwork Personal Communications Version 4.2 for Windows 95 and Windows NT, Reference*, SC31-8477

### **IBM Client Access/400 Family**

*IBM Client Access/400 for DOS with Extended Memory: Setup*, SC41-3500

*IBM Client Access/400 for DOS with Extended Memory: User's Guide*, SC41-3501

*IBM Client Access/400 for DOS with Extended Memory: Getting Started*, SC41-3504

*IBM Client Access/400 for DOS: Quick Installation*, SC41-3505

*IBM Client Access/400 for DOS: Setup*, SC41-3556



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*IBM Client Access/400 for DOS: User's Guide, SC41-3557*

*IBM Client Access/400 for DOS: Application Programming Interface Reference, SC41-3562*

*IBM Client Access/400 for Windows 3.1: Getting Started, SC41-3530*

*IBM Client Access/400 for Windows 3.1: Setup, SC41-3552*

*IBM Client Access/400 for Windows 3.1: Application Programming Interface Reference, SC41-3531*

### **Novell products**

*Novell NetWare APPC Technical Reference*

*Novell NetWare for SAA Version 1.3 Administration Guide*

*NetWare 3270 LAN Workstation for DOS User's Guide*

*NetWare 3270 LAN Workstation for DOS Configuration Guide*

*NetWare LU6.2 for Windows Configuration Guide*

*Novell NetWare for SAA Version 2.0 Administration Guide for Mainframes and Peer Nodes*

*Novell NetWare for SAA Version 2.0 API Configuration Guide for Microsoft Windows Clients*

*Novell NetWare for SAA Version 2.0 API Configuration Guide for DOS and NetWare Clients*

*Novell NetWare for SAA Version 2.2 Getting Started*

*Novell NetWare for SAA Version 2.2 Installation*

*Novell NetWare for SAA Version 2.2 Operation and Diagnosis*

### **Apple products**

*SNA•ps Administrator's Guide*

*SNA•ps APPC Programmer's Reference*

*IBM/Apple Enterprise Networking Guide for SNA Products, GC31-7009-01*

### **Microsoft products**

*Microsoft SNA Server Installation Guide*

*Microsoft SNA Server Administration Guide*

*Microsoft SNA Server Reference*

### **Systems Network Architecture (SNA)**

*SNA Formats, GA27-3136*

*Systems Network Architecture Technical Overview, GC30-3073*

## Preface

### Configuration, distribution, installation publications

The following books provide information on configuration, distribution, and installation (CID):

*NetView Distribution Manager/2: Concepts and Overview Version 2.0*, GH19-4009

*IBM Start/2 User's Guide*, S96F-8398

*SystemView for OS/2 Up and Running!*, SH19-4184

### Novell NetWare documentation

The use of Novell's ODI to support multiple protocols on a single adapter is described in:

*NOVELL: NetWare ODI Shell for DOS.*

The use of Novell's NetBIOS Emulator in an OS/2 Requester is described in:

*NOVELL: NetWare Requester for OS/2*

*NOVELL: NetWare Version 3.11 Installation*

*NOVELL: NetWare Version 4.0 Installation*

*Coexistence Guide for OS/2 LAN Server and NetWare from IBM*, S96F-8311

### Hardcopy documentation

For details of printing hardcopy versions of the books, or ordering printed copies from IBM, see Appendix A, "The IBM CICS Clients library" on page 255.

### Online documentation

The IBM CICS Clients publications are available in the following online documentation formats:

- IBM Information Presentation Facility (IPF)
- HyperText Markup Language (HTML)
- Portable Document Format (PDF).

For details of how to use online documentation, see Appendix A, "The IBM CICS Clients library" on page 255.

## An introduction to IBM CICS Clients

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### Chapter 1. Overview

**This chapter contains the following:**

- “An introduction to IBM CICS Clients”
- “CICS clients communication” on page 2
- “The benefits of using CICS clients” on page 4
- “CICS clients functions” on page 4.

---

### An introduction to IBM CICS Clients

The IBM CICS Clients family comprises workstation products that bring the advantages of client/server operation to your transaction processing. CICS clients allow users to access transactions and programs on the entire family of CICS application servers.

The IBM CICS Clients family comprises:

- IBM CICS Client for DOS
- IBM CICS Client for OS/2
- IBM CICS Client for Windows
- IBM CICS Client for Windows 95
- IBM CICS Client for Windows NT
- IBM CICS Client for Macintosh

The CICS clients can communicate with the following CICS server products:

- CICS for OS/2 Version 2.0.1, and higher
- CICS Transaction Server for OS/2 Warp Version 4.0, which includes CICS for OS/2 Version 3.0
- CICS for Windows NT Version 2
- Transaction Server for Windows NT Version 4.0 and later, which includes CICS for Windows NT Version 3.0
- ‘CICS on Open Systems’, that is:
  - CICS for AIX
  - CICS for HP-UX
  - CICS for Digital UNIX
  - CICS for Siemens-Nixdorf SINIX
  - CICS for Sun Solaris.
- Transaction Server for AIX Version 4.0
- CICS/400 Version 3 Release 1, and higher
- CICS for MVS/ESA Version 3 Release 3, and higher
- CICS/MVS Version 2 Release 1.2

## CICS clients communication

- CICS/VSE Version 2 Release 2 and higher

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## CICS clients communication

The CICS clients can communicate via the following protocols:

- Network Basic Input/Output System (NetBIOS)
- Transmission control protocol/Internet protocol (TCP/IP)
- Advanced program-to-program communication (APPC)

CICS Client for OS/2, CICS Client for Windows 95 and CICS Client for Windows NT can also communicate with CICS for MVS/ESA through the IBM TCP62 protocol mapper, which allows APPC applications to communicate over a TCP/IP network.

Table 2 on page 19 shows for each client the protocols that can be used to communicate with each server, and the functions supported. For each CICS client, support for each protocol may be provided by one or more communication software products. You can therefore use the products best suited to your network environment.

CICS clients can communicate with CICS application servers via APPC, usually through a local area network (LAN) and Systems Network Architecture (SNA) *gateway*.

A variety of LAN environments are supported:

- In an IBM LAN Server LAN, gateway communication facilities can be provided by a SNA product running on the gateway machine, for example, IBM Communications Manager/2.
- You can use Microsoft SNA Server, or IBM Communications Server for APPC communication between CICS Client for Windows Family and CICS servers.
- You can use CICS Client for DOS and CICS Client for Windows Family in a Novell NetWare LAN, with Novell NetWare for SAA (running in a gateway workstation) providing APPC communication to a CICS server.
- On an AppleTalk (or other type of) LAN you can use a SNA•ps gateway for APPC communication between CICS Client for Macintosh and CICS servers. The SNA•ps gateway is Apple Computer Inc's implementation of SNA protocols and services, and is an integrated 3270, 5250 APPC gateway.

For more information, see Gateways on page 12.

A CICS client can communicate with multiple CICS servers. A client initialization file determines the parameters for client operation and identifies the associated servers and protocols used for communication.

The CICS clients can communicate with a server by three mechanisms:

- The *External Call Interface (ECI)*, which enables the design of new applications to be optimized for client/server operation, with the business logic on the server and the presentation logic on the client.

- The *External Presentation Interface* (EPI), which enables modern technologies, such as graphical or multimedia interfaces, to be used with traditional 3270 CICS applications.
- *3270 terminal and printer emulation*. This provides CICS 3270 emulation for CICS servers to which the client is connected.

Object oriented programming support is provided for the ECI and EPI; for all CICS clients except CICS Client for DOS and CICS Client for Macintosh. for more information, see the *CICS Family: OO Programming in C++ for CICS Clients* and *CICS Family: OO Programming in BASIC for CICS Clients* books.

**Note:** Some CICS servers do not support the EPI or terminal emulation, see “Communication between IBM CICS Clients and CICS servers” on page 19.

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## CICS clients and DCE

The Distributed Computing Environment (DCE) provides secure, authenticated, client/server interoperability across diverse platforms. Of the CICS clients, DCE support is provided for CICS Client for Windows NT. The DCE support makes locating servers easier, and provides a more secure environment for client/server communication.

For more information, refer to Chapter 7, “CICS client support for DCE” on page 205.

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## CICS Gateway for Java

CICS Client for OS/2 and CICS Client for Windows NT provide a CICS Gateway for Java. This provides an interface between a Java program and CICS, and so allows a Java Enabled Browser (or a Network Computer) to dynamically download a Java Applet and transparently access CICS data. The CICS Gateway for Java therefore enables state-of-the-art access to existing CICS applications from a machine that simply has a Java Virtual Machine installed.

The CICS Gateway for Java is a Java application that is installed, along with a CICS client, on a machine that is running a Web server.

The latest version of the CICS Gateway for Java is available for download without charge from the following WWW page:

<http://www.hursley.ibm.com/cics/internet/cicsgw4j>

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## CICS gateway for Lotus Notes and CICS Internet gateway

CICS Client for OS/2 and CICS Client for Windows NT incorporate CICS gateway for Lotus Notes, (also known as CICS link for Lotus Notes). This provides a mechanism by which a Lotus Notes application may access resources on any CICS server. This function uses the ECI, and therefore brings access to Lotus Notes to members of the CICS family on all platforms.

## CICS clients functions

CICS Client for OS/2 and CICS Client for Windows NT incorporate CICS Internet gateway, which enables a Web browser to be used as an emulator via the Internet for a 3270 CICS application running on a CICS server. This function uses the EPI, and therefore is subject to the same restrictions in supported servers as the EPI, see Table 2 on page 19.

CICS gateway for Lotus Notes and CICS Internet gateway are described in the *IBM CICS Clients Gateways* book.

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### The benefits of using CICS clients

You can use CICS clients for the *presentation logic* of applications. This offloads work from the CICS servers and allows the application to exploit modern graphical or multimedia interfaces, for increased usability and productivity. Depending on the form of implementation, the existing application need not be altered at all—a protection of your investment.

Data can be exchanged directly between CICS and applications at the workstation; for example, spreadsheets. Furthermore, the power of the client applications is considerably enhanced by their ability to access applications and databases on **multiple** CICS server platforms. This ability allows CICS users on every platform to write new modern applications that use client/server operation.

Using the ECI, applications can easily be written to interface non-terminal devices, for example, image scanners and bar-code readers, with a CICS server.

Local printers attached to desktop workstations can be used for printing output sent from CICS applications.

In a distributed network you can install multiple copies of CICS Client for OS/2 onto many workstations using a distributed management product, for example, IBM SystemView for OS/2, or IBM NetView Distribution Manager (NetView DM). See Chapter 9, “Distributing CICS clients in a network” on page 239 for more information.

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## CICS clients functions

This section summarizes the functions of CICS clients.

### 3270 terminal emulation

CICS 3270 emulation enables a client workstation to function as a 3270 display or printer for CICS applications, without needing a separate 3270 emulator product. This provides flexible client workstation capabilities without the need for extensive software outlay.

Because each client (except CICS Client for DOS) can run multiple CICS 3270 emulation sessions, the hardware required is reduced, and you can use multiple 3270 emulator sessions from one or more CICS servers, all on one workstation.

## CICS clients functions

By means of mapping files, you can customize the client emulator's screen color attributes and keyboard settings. This allows users to tailor the machine to their own preferences or, for example, to comply with company standard keyboard layouts.

CICS clients terminal definitions (with some exceptions, see "Communication between IBM CICS Clients and CICS servers" on page 19) are autoinstalled at most CICS server systems, and do not have to be predefined at the server.

### The External Call Interface

The ECI enables a non-CICS client application to call a CICS program synchronously or asynchronously, as a subroutine. The client application communicates with the server CICS program using a data area called a COMMAREA. The COMMAREA is passed to the CICS server on the call, and the CICS program typically populates it with data accessed from files or databases, which is then returned to the client for manipulation or display.

CICS clients (except CICS Client for DOS) can support an unlimited number of concurrent ECI calls to a CICS server, with no restrictions on communication protocols, functions, or whether the calls are to the same or different CICS systems. For CICS Client for DOS, there is a limit of 16 concurrent calls.

The ECI is the recommended interface for developing new client/server applications. Its call structure easily divides the presentation logic (usually in the client) from the business logic in the CICS application, offering application designers maximum flexibility. As an example, the ECI can be used with mainframe CICS applications that are already divided into business logic (in the application-owning region) and presentation logic (in the terminal-owning region). The business logic can remain unaltered when the presentation logic is developed.

### The External Presentation Interface

The EPI enables client applications to start and converse with a legacy 3270 CICS application running on the CICS server. The CICS application sends and receives 3270 data streams (for example, a CICS basic mapping support (BMS) transaction) to and from the client application as though it were conversing with a 3270 terminal. The client application captures these data streams and, typically, displays them with a non-3270 presentation product, such as graphical user interface (GUI) or multimedia software.

The EPI is therefore a method of enhancing an existing CICS application by adding a graphical or other modern interface. The CICS application itself does not need to be altered.

For CICS Client for DOS, CICS Client for Windows and CICS Client for Macintosh, there may be up to 15 concurrent EPI calls. For the other CICS clients, there is no limit.

## **CICS clients functions**

### **Associated products**

A growing number of workstation-based application development products can be used to exploit the ECI and EPI, for example:

- IBM VisualAge for OS/2
- IBM VisualAge for Windows
- IBM VisualGen
- IBM CICS Internet Extensions
- Lotus Notes

Other rapid application development (RAD) tools can also be used.

### **3270 client printer support**

CICS 3270 client printer support is the ability to define a printer terminal on the client workstation. This enables CICS applications running on the server to direct output to the client-attached printer.

You can direct the output to a physical printer attached, for example, to the LPT1 port, or you can specify a command to process the data into a format more suitable for special-purpose printers.

CICS 3270 client printer support uses CICS 3270 emulation functions. See Table 2 on page 19 for information on which CICS servers currently support CICS 3270 emulation and hence CICS 3270 client printer support.



## Client control

CICS clients provide commands or icons to:

- **Control the client process**

You can:

- Start or stop the client process
- Turn client trace on or off
- Specify the client initialization file to be used
- Set up security by specifying user IDs and passwords for a CICS server
- List connected servers
- Enable and disable the display of messages.

- **Control terminal emulation**

You can:

- Start and stop the terminal emulator
- Specify the initial transaction
- Define the terminal characteristics
- Specify the name of the keyboard and screen color mapping files
- Define the command used to process print requests
- Specify the name of a file used for appending print requests.

- **Control client printer operation**

You can:

- Start and stop the client printer emulator
- Specify the initial transaction to be run against the client printer
- Define the printer terminal characteristics
- Define the command used to process print requests
- Specify the name of a file used for appending print requests.

---

## CICS telnet support

CICS clients provides a command, CICSTELD, to start a CICS telnet daemon. You can then use any telnet 3270 client to access a CICS server through the CICS telnet daemon.

For more information, see “CICS Client telnet terminal support” on page 202.



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## Chapter 2. Planning before installation

This chapter describes the following:

- “IBM CICS Clients and your network”
- “Communication protocols” on page 21
- “Hardware requirements” on page 22
- “Software requirements” on page 24

This contains a section for each CICS client:

- “CICS Client for DOS software requirements”
- “CICS Client for OS/2 software requirements”
- “CICS Client for Windows 3.x software requirements”
- “CICS Client for Windows 95 software requirements”
- “CICS Client for Windows NT software requirements”
- “CICS Client for Macintosh software requirements”

This chapter helps you plan the installation of CICS clients. It discusses the ways in which CICS clients can be implemented in your network and the means by which they can connect with CICS servers. It also discusses the relevant communication protocols and lists the prerequisite hardware and software.

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### IBM CICS Clients and your network

This section discusses the various ways in which CICS clients can communicate with CICS servers, and the ways in which you can access the CICS clients code within your network.

#### Connections to CICS servers

“Communication between IBM CICS Clients and CICS servers” on page 19 shows which CICS servers the CICS clients can connect to, the protocols used, and the functions supported.

All CICS clients (except CICS Client for Macintosh) on a LAN can connect to CICS for OS/2 and CICS for Windows NT Version 2 (but *not* CICS for Windows NT Version 3.0), using the NetBIOS protocol. See Figure 1 on page 10.

The LAN could be either an IBM, Microsoft, or a Novell NetWare LAN. It can be a token-ring or Ethernet LAN.

## IBM CICS Clients and your network

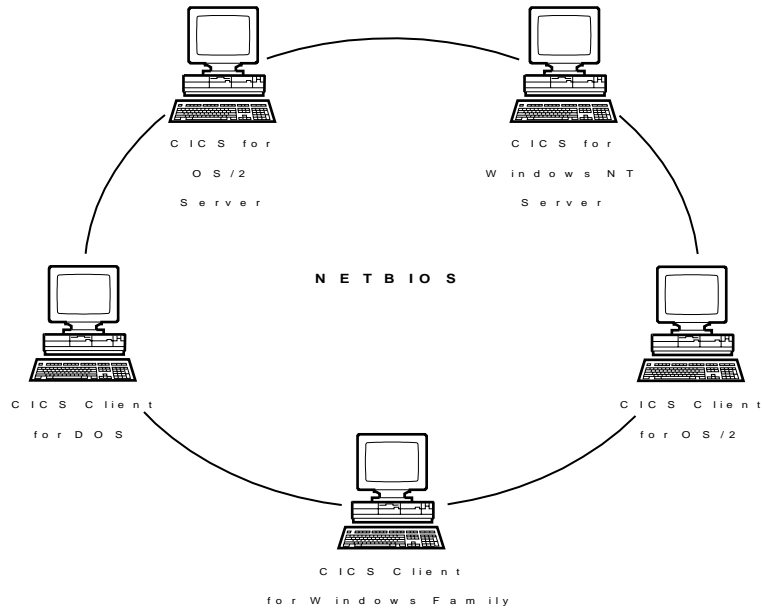


Figure 1. CICS clients communicating over NetBIOS

All CICS clients can connect to CICS for OS/2, CICS for Windows NT, and CICS on Open Systems servers using the TCP/IP protocol. See Figure 2.

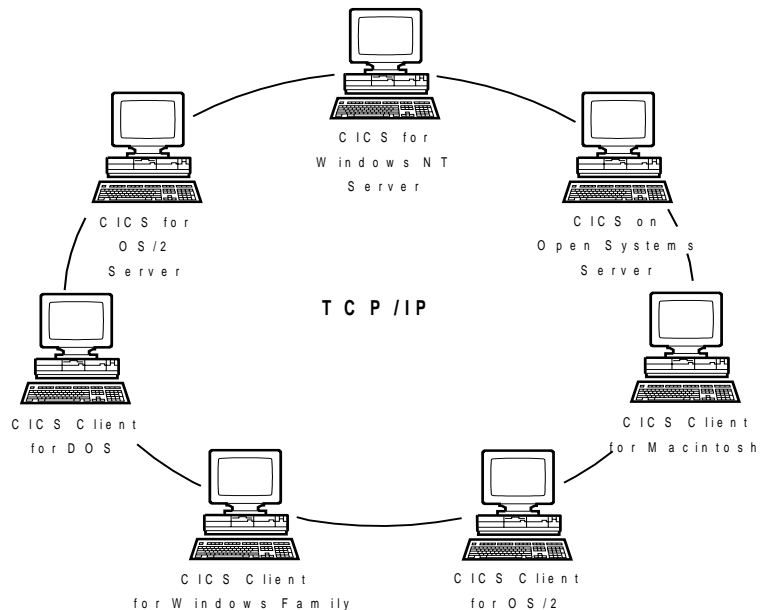


Figure 2. CICS clients communicating over TCP/IP

## IBM CICS Clients and your network

All CICS clients can communicate with CICS application servers via APPC, (see Figure 3 and Figure 4 on page 12). This is commonly achieved through a LAN and a workstation acting as a **SNA gateway**. However, CICS Client for OS/2 and CICS Client for Windows can communicate directly with a CICS server without a gateway workstation. This facility is provided by, for example, Communications Manager/2 for CICS Client for OS/2, and IBM APPC Networking Services for Windows for CICS Client for Windows.

CICS Client for DOS and CICS Client for Windows can communicate over APPC with CICS/400 via Client Access/400.

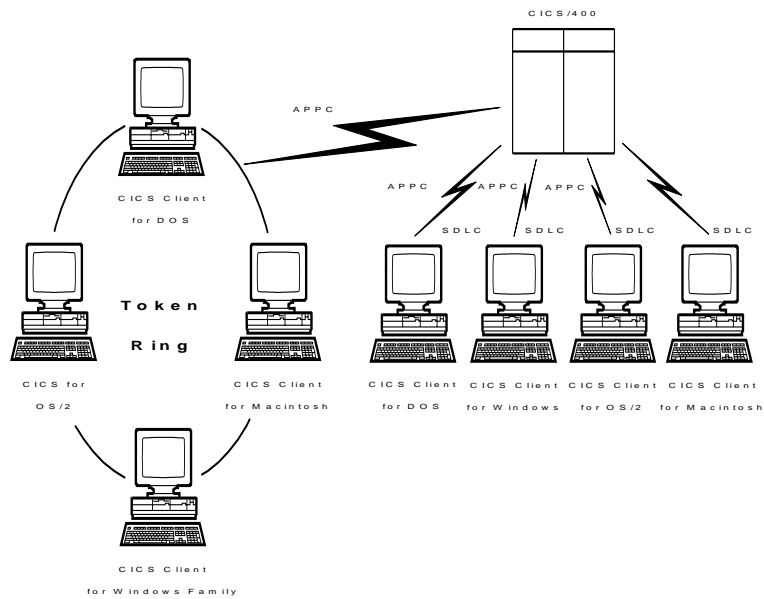


Figure 3. CICS clients communicating over APPC to CICS/400

## IBM CICS Clients and your network

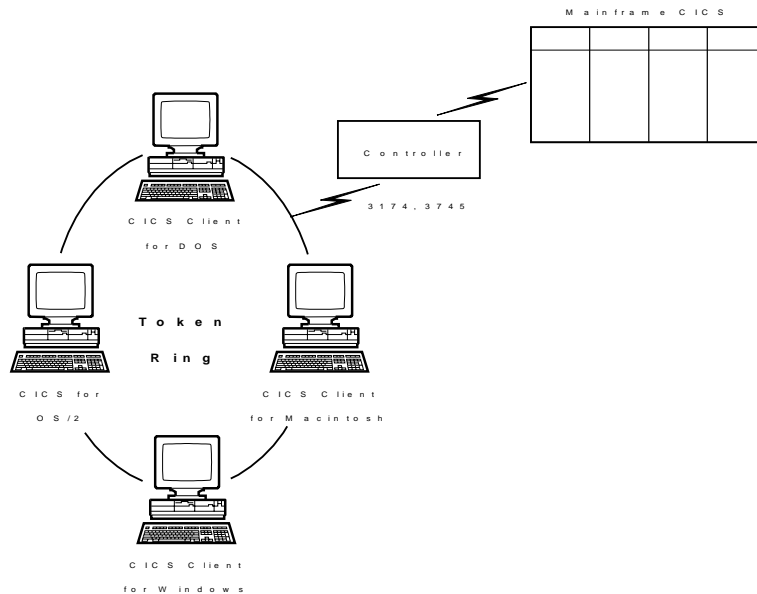


Figure 4. CICS clients communicating over APPC to mainframe CICS

### Gateways

A gateway is a device that connects two dissimilar LANs, or that connects a LAN to a wide area network (WAN), midrange computer, or mainframe computer. A gateway device has its own processor and memory and may perform protocol conversion.

The physical links from a gateway to CICS server machines can be made in a variety of ways; for example, via token ring, SDLC, or coaxial connections. For example, a gateway workstation on a LAN can be connected directly by token ring cable to an IBM 3745 controller, the front-end processor for a mainframe.

A SNA gateway workstation attaches to a mainframe CICS or CICS/400 machine and handles multiple communication sessions simultaneously. Therefore, a separate connection is not required for each CICS client workstation. To each CICS client workstation, it appears that they are attached directly to the CICS server, but the communication data is actually routed through one of the gateway's sessions.

SNA gateway software is required in the gateway workstation to provide gateway server functions to the clients on the LAN:

- **In an IBM LAN environment**, Communications Manager/2 is used (see Figure 5 on page 13), though a product such as IBM AIX SNA Gateway/6000 Version 2.1 could be used.

## IBM CICS Clients and your network

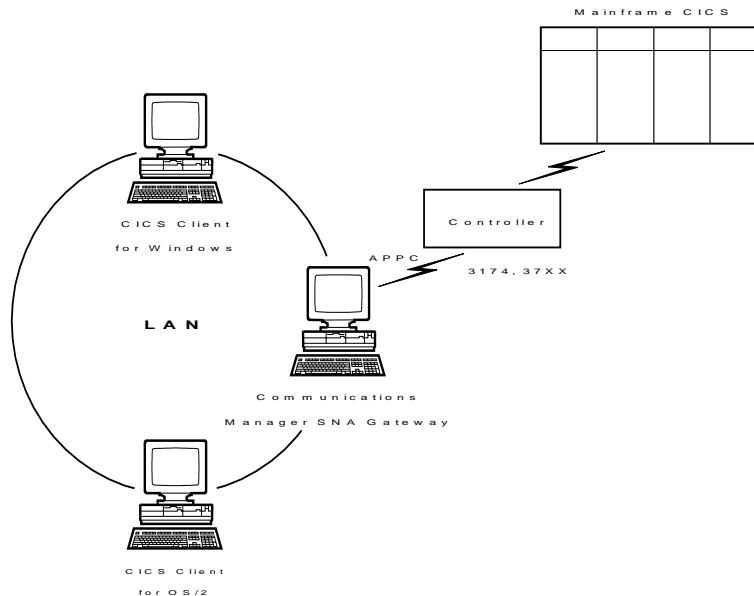


Figure 5. CICS clients communicating over APPC via a SNA gateway

- **In a Novell NetWare LAN**, CICS Client for DOS, CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT can communicate using APPC, with Novell NetWare for SAA in the gateway workstation (see Figure 6 on page 14).

## IBM CICS Clients and your network

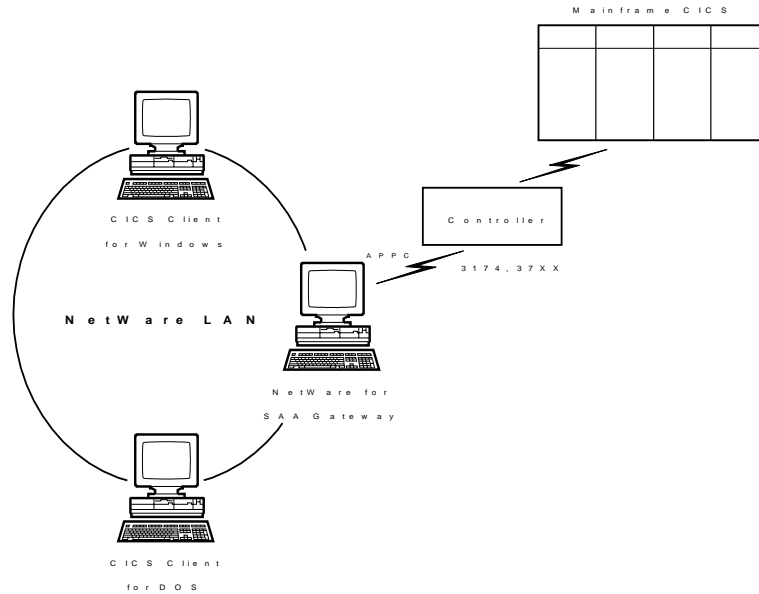


Figure 6. CICS clients communicating over APPC via a NetWare for SNA gateway

- **In a Microsoft SNA Server or IBM Communications Server environment**, the CICS Client for Windows Family can communicate over APPC. (See Figure 7).

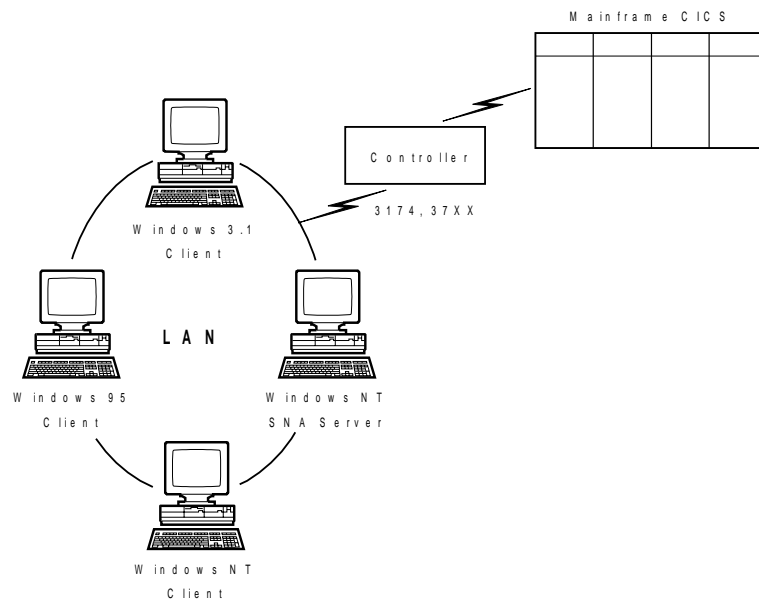


Figure 7. CICS clients communicating over APPC via Microsoft SNA Server



## **IBM CICS Clients and your network**

You can install SNA Server on a single Windows NT workstation or use Windows 3.x, Windows NT, or Windows 95 SNA Client programs with the SNA Server program. In this case, SNA Client is installed on each client workstation, and supports the APPC API, while SNA Server is installed on another workstation, and provides the SNA transport layer used to communicate with other systems.

When used in this manner, a single SNA Server system can support multiple Windows Family SNA Client systems. Similarly, you can use Communications Server on a single Windows NT workstation, or use Communications Server clients on individual client machines.

## IBM CICS Clients and your network

- *In an AppleTalk or TokenTalk LAN, CICS Client for Macintosh can communicate using APPC with SNA•ps in the gateway workstation (see Figure 8).*

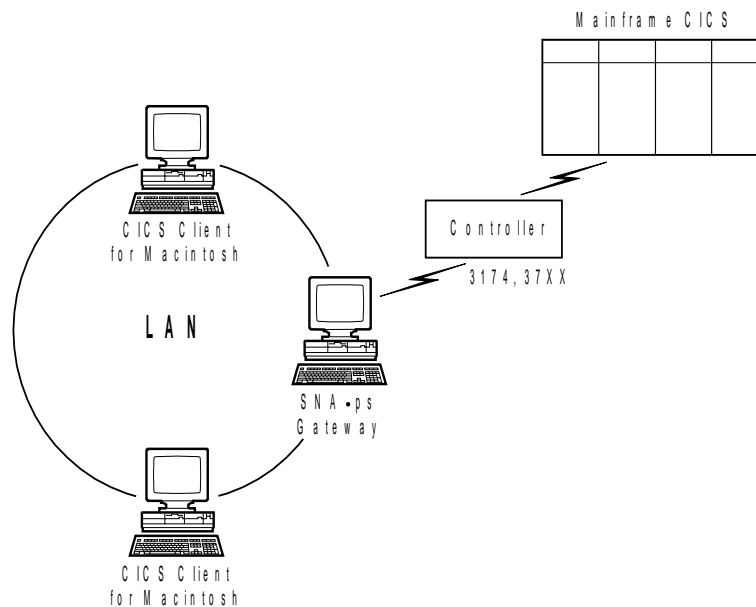


Figure 8. CICS clients communicating over APPC via a SNA•ps gateway

## Accessing the CICS clients

It is possible to access CICS clients on your LAN in a number of ways:

1. You can have CICS clients code on each of the workstations from which you want to use CICS.
2. You can install CICS clients code on one workstation in the LAN, and use this machine as a LAN server to the other workstations in the LAN. The client code is therefore accessed via LAN redirection. This approach may be suitable if all of the clients use the same protocols and communicate with the same CICS servers.
3. You can have CICS clients code installed on a LAN server and have individual client initialization files at the other workstations in the LAN. This provides more flexibility than approach 2.

**Note:** If your CICS clients code resides on a LAN server, then problems may occur if the network drive is later detached, as the code would no longer be available.

Chapter 9, "Distributing CICS clients in a network" on page 239 describes how you can distribute CICS Client for OS/2 and CICS Client for Windows around your network.

## IBM CICS Clients and your network

### Multiple protocol configurations

IBM CICS Clients can communicate with multiple servers simultaneously using the same or different communication protocols.

Figure 9 shows a CICS Client for OS/2 communicating simultaneously with a CICS on Open Systems server using TCP/IP, a CICS for OS/2 server using NetBIOS, and a CICS mainframe using APPC.

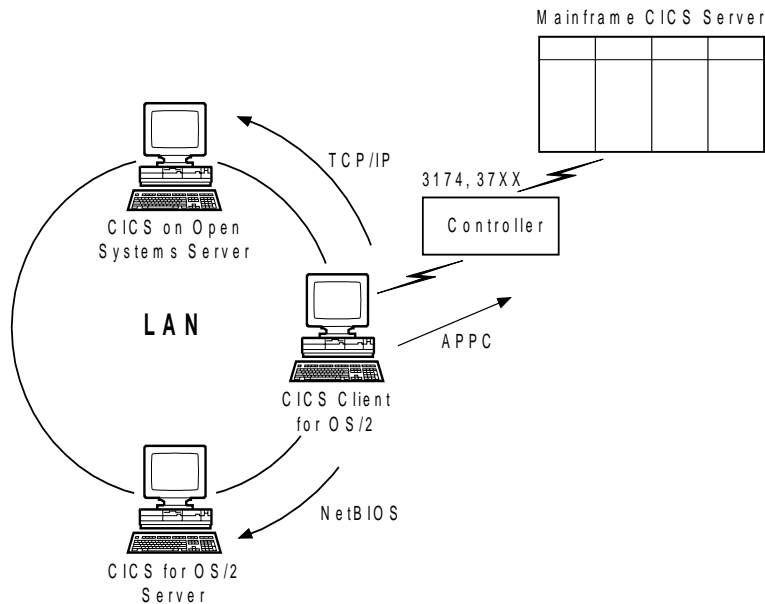


Figure 9. CICS client communicating over NetBIOS, TCP/IP, APPC

## IBM CICS Clients and your network

### Mobile communication

CICS clients can communicate using mobile (wireless) communications in the same way that a CICS for OS/2 server can (see Figure 10). Mobile communication is achieved using either LAN Distance Remote for OS/2, or LAN Distance Remote for Windows on the client workstation. The LAN Distance Connection Server product is required on the gateway machine on the token-ring.

The connection from the client workstation and the connection to the server are by modem. The connection between the two modems can be either a cellular radio or a telephone connection.

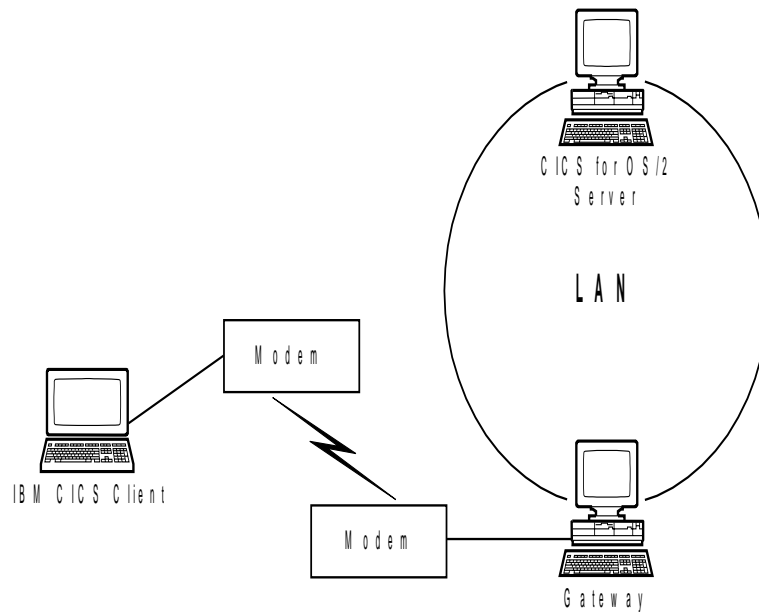


Figure 10. Mobile communication to a CICS server

## IBM CICS Clients and your network

### Communication between IBM CICS Clients and CICS servers

You should read the following table in conjunction with the notes that follow it:

*Table 2 (Page 1 of 2). Communication between IBM CICS Clients and CICS servers and functions*

SERVER	CLIENT	NetBIOS	TCP/IP	APPC	ECI	EPI Emulation	AUTO-INSTALL
CICS for OS/2 Version 2.0.1	DOS	•	•	○	•	•	•
	Windows 3.1	•	•	○	•	•	•
	Windows NT	•	•	○	•	•	•
	Windows 95	•	•	○	•	•	•
	OS/2	•	•	○	•	•	•
	Macintosh	○	•	○	•	•	•
CICS for OS/2 Version 3.0	DOS	•	•	•	•	•	•
	Windows 3.1	•	•	•	•	•	•
	Windows NT	•	•	•	•	•	•
	Windows 95	•	•	•	•	•	•
	OS/2	•	•	•	•	•	•
	Macintosh	○	•	•	•	•	•
CICS for Windows NT Version 2	DOS	•	•	○	•	•	•
	Windows 3.1	•	•	○	•	•	•
	Windows NT	•	•	○	•	•	•
	Windows 95	•	•	○	•	•	•
	OS/2	•	•	○	•	•	•
	Macintosh	○	•	○	•	•	•
Transaction Server for Windows NT Version 4	DOS	○	•	•	•	•	•
	Windows 3.1	○	•	•	•	•	•
	Windows NT	○	•	•	•	•	•
	Windows 95	○	•	•	•	•	•
	OS/2	○	•	•	•	•	•
	Macintosh	○	•	•	•	•	•
CICS on Open Systems	DOS	○	•	•	•	•	•
	Windows 3.1	○	•	•	•	•	•
	Windows NT	○	•	•	•	•	•
	Windows 95	○	•	•	•	•	•
	OS/2	○	•	•	•	•	•
	Macintosh	○	•	•	•	•	•
Transaction Server for AIX Version 4	DOS	○	•	•	•	•	•
	Windows 3.1	○	•	•	•	•	•
	Windows NT	○	•	•	•	•	•
	Windows 95	○	•	•	•	•	•
	OS/2	○	•	•	•	•	•
	Macintosh	○	•	•	•	•	•
CICS/400 Version 3.1	DOS	○	○	•	•	•	•
	Windows 3.1	○	○	•	•	•	•
	Windows NT	○	○	•	•	•	•
	Windows 95	○	○	•	•	•	•
	OS/2	○	○	•	•	•	•
	Macintosh	○	○	•	•	•	•
CICS for MVS/ESA Version 4.1	DOS	○	○	•	•	○	•
	Windows 3.1	○	○	•	•	○	•
	Windows NT	○	•	•	•	○	•
	Windows 95	○	•	•	•	○	•
	OS/2	○	•	•	•	○	•
	Macintosh	○	○	•	•	○	•

## IBM CICS Clients and your network

*Table 2 (Page 2 of 2). Communication between IBM CICS Clients and CICS servers and functions*

SERVER	CLIENT	NetBIOS	TCP/IP	APPC	ECI	EPI Emulation	AUTO-INSTALL
Transaction Server for OS/390 Version 1.1	DOS	○	○	●	●	●	●
	Windows 3.1	○	○	●	●	●	●
	Windows NT	○	●	●	●	●	●
	Windows 95	○	●	●	●	●	●
	OS/2	○	●	●	●	●	●
	Macintosh	○	○	●	●	●	●
CICS for MVS/ESA Version 3.3	DOS	○	○	●	●	○	●
	Windows 3.1	○	○	●	●	○	●
	Windows NT	○	●	●	●	○	●
	Windows 95	○	●	●	●	○	●
	OS/2	○	●	●	●	○	●
	Macintosh	○	○	●	●	○	●
CICS/MVS Version 2.1.2	DOS	○	○	●	●	○	●
	Windows 3.1	○	○	●	●	○	●
	Windows NT	○	○	●	●	○	●
	Windows 95	○	○	●	●	○	●
	OS/2	○	○	●	●	○	●
	Macintosh	○	○	●	●	○	●
CICS/VSE Version 2.2	DOS	○	○	●	●	○	●
	Windows 3.1	○	○	●	●	○	●
	Windows NT	○	○	●	●	○	●
	Windows 95	○	○	●	●	○	●
	OS/2	○	○	●	●	○	●
	Macintosh	○	○	●	●	○	●

**Note:** ● = supported, ○ = not supported.

### Notes on table:

1. EPI always incorporates CICS 3270 terminal emulation and CICS 3270 client printer support.
2. Autoinstall means that the user does not need to predefine the CICS client to the CICS server, that is, control table definitions are automatically created for the client at the CICS server. For CICS for MVS/ESA Version 3.3, CICS/MVS, and CICS/VSE, autoinstall is possible via LU 6.2 single session only.
3. TCP/IP communication with CICS for OS/2 requires CICS for OS/2 Version 2.0.1, or later, or CICS OS/2 Version 2.0 with CSD level 4.
4. TCP/IP communication between CICS Client for OS/2, CICS Client for Windows NT, CICS Client for Windows 95 and CICS for MVS/ESA Version 3.3 and later is achieved using TCP62 support.
5. EPI Emulation is supported on CICS for MVS/ESA Version 4.1 with APAR PN68409.

### Restrictions on the use of CICS servers

The following restrictions apply:

- For CICS/400, DBCS languages are not supported.
- For CICS/400, the CEDA transaction cannot be started from a client terminal.

## Communication protocols

- For CICS/400, you cannot use PF1 to get CICS online help from a client terminal.
- DBCS is not supported on CICS for Windows NT Version 2.

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### Communication protocols

This section discusses the protocols that can be used for client/server communication, and which protocols can be used for a particular client/server connection.

#### Which protocols can you use?

The following protocols can be used for communication between CICS clients and CICS servers:

**NetBIOS** Network Basic Input/Output System (NetBIOS) is a communication interface for the LAN environment. NetBIOS is used for connections between CICS clients and CICS for OS/2 servers and CICS for Windows NT (Version 2 only) in IBM LAN Server, Novell NetWare, and other network environments.

**Note:** CICS Client for Macintosh does not support the use of NetBIOS.

**TCP/IP** Transmission Control Protocol/Internet Protocol (TCP/IP) is a widely used, robust, suite of protocols, particularly important in connecting heterogeneous networks. TCP/IP originated from the UNIX operating system, but is now supported by a multitude of operating systems including AIX, OS/2, VM, MVS, DOS, and Apple Macintosh. TCP/IP is used for connections between CICS clients and CICS for OS/2, CICS for Windows NT, and CICS on Open Systems servers. Also, with the TCP62 support provided with CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT access is provided to CICS for MVS/ESA Version 3.3 and later.

**APPC** Advanced Program-to-Program Communication (APPC) is a commonly used term for the verbs and services included in the SNA Logical Unit type 6.2 (LU 6.2). An LU 6.2 communication session provides device-independent application-to-application communication. APPC is used for connections between CICS clients and most CICS servers.

In addition to these protocols, CICS Client for Windows NT can use DCE Remote Procedure Calls (RPC) for connection with a CICS server with the equivalent DCE functionality. For more information, see Chapter 7, "CICS client support for DCE" on page 205.

Also, if you install CICS Client for OS/2 on the same machine as CICS for OS/2 Version 3.1, the client can communicate with one or more CICS servers using the CICS internal Multi-region Operation (MRO) protocol. For more information, refer to *CICS for OS/2 Operation*, SC33-1582..

The protocols that can be used for the various client/server connections are shown in Table 2 on page 19.

## Hardware requirements

### Why use a particular protocol?

As shown in Table 2, some protocols can be used only for certain types of client/server connection.

APPC can be used for links with most CICS servers, but not for CICS for Windows NT Version 2, or earlier versions of CICS for OS/2 and CICS for AIX. However, for these types of connection TCP/IP can be used.

If you need to connect different types of networks, for example, Token Ring and Ethernet networks, you will probably want to use TCP/IP. Indeed, TCP/IP is assuming ever greater importance and use in Internet communication.

With the TCP62 support provided for CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT, the CICS clients can access CICS for MVS/ESA using the TCP/IP network. This allows partner LU62 applications to communicate without complex SNA configuration definitions on the client, and without any changes to the LU62 applications on the client or server. Therefore, if you require easy client access to CICS for MVS/ESA over your TCP/IP network you should use the TCP62 support. For information on configuring TCP62, see "TCP62 configuration" on page 91.

If you are already using a particular protocol, you may wish to continue with that protocol alone. Note however, that you can only have one SNA stack on a system. The CICS Host TCP/IP Access Feature contains a SNA stack, so this cannot be used simultaneously with an existing SNA stack on the same system. See "Coexistence of TCP62 with SNA protocol on Windows NT/95" on page 93.

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## Hardware requirements

CICS clients run on any machine capable of running the appropriate operating system and other prerequisite software.

**CICS Client for DOS** and **CICS Client for Windows Family** require any IBM compatible PC, provided it supports the operating system and has sufficient memory for the required software components. For CICS Client for Windows, a minimum of 2 MB of memory (where MB equals 1 048 576 bytes) is recommended. CICS Client for Windows 95 will run in the minimum 8 MB of memory required by Windows 95. CICS Client for Windows NT will run in the minimum 16 MB of memory required by Windows NT.

**CICS Client for OS/2** requires any machine that supports IBM OS/2 Version 2.0 or higher. This implies a machine with an Intel 386SX or higher processor.

**CICS Client for Macintosh** requires any machine containing the Motorola M68020 (or higher) processor, for example, an Apple Classic II, or an Apple LC II. The PowerMac is also supported. For CICS Client for Macintosh, a minimum of 4 MB of memory is recommended. However, if other software components are to run concurrently with the CICS client, the total memory requirement may be greater.



## Hardware requirements

The CICS Client for Macintosh is compatible with the Virtual Memory mode of System 7 (accessible from the Memory Control Panel), although use of this Macintosh feature may affect performance.

### Adapters

You need adapters to connect the client workstations to the LAN and cards to provide the necessary connection at any gateway workstation.

#### Connecting to the LAN

To connect an IBM Personal System/2 (PS/2) or a PC to a LAN, a suitable adapter such as one of the following is required:

- The IBM Token-Ring Network Adapter/A
- The IBM Token-Ring Network 16/4 Adapter
- A suitable ETHERAND network adapter

To connect a workstation to a Novell NetWare LAN, a suitable Token-Ring or Ethernet network adapter is required.

To connect a Macintosh workstation to an AppleTalk LAN, a LocalTalk connection is required.

#### Gateway cards

For a gateway on an IBM LAN, a Token-Ring or ETHERAND network adapter, or coaxial connection is required.

For a gateway on a Novell NetWare LAN using NetWare for SAA, a suitable Token-Ring or Ethernet network adapter or coaxial connection is required.

For a gateway on an AppleTalk LAN using SNA•ps, one of the following is required in the gateway workstation, configured with at least 1 MB of memory:

- Apple Token Ring 4/16 NB card
- Apple Serial NB card (for an SDLC link)
- Apple Coax/Twinax card (for a Coax link)

### Disk space

The following disk space is required for the client code, samples and online (IPF) documentation (in addition to the requirements of the base operating system and application programs):

Client	Disk space (MB)
CICS Client for DOS	1.0
CICS Client for OS/2	3.5
CICS Client for Windows	3.5
CICS Client for Windows 95	3.5
CICS Client for Windows NT	3.5

## Software requirements

CICS Client for Macintosh 1.0

There is an additional requirement of 4.5 MB if you select the CICS Internet gateway component of CICS Client for OS/2 and CICS Client for Windows NT. Also, if you install the CICS Gateway for Java component of CICS Client for OS/2 and CICS Client for Windows NT, you will require a further 1 MB.

For the TCP62 support for CICS Client for Windows NT and CICS Client for Windows 95, you will require an additional 5.8 MB and 7.0 MB respectively.

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## Software requirements

This section lists the operating systems under which CICS clients can run and the communication software necessary to connect to CICS servers. There is a section for each CICS client:

- “CICS Client for DOS software requirements” on page 25
- “CICS Client for OS/2 software requirements” on page 27
- “CICS Client for Windows 3.x software requirements” on page 29
- “CICS Client for Windows 95 software requirements” on page 31
- “CICS Client for Windows NT software requirements” on page 32
- “CICS Client for Macintosh software requirements” on page 34

**Note:** It is important that you consult the README.TXT file supplied with IBM CICS Clients for further information on software levels required, and possible restrictions on the use of products.

Clients may be double-byte character set (DBCS) enabled, in which case language-specific versions of the operating system are used. In the following sections:

**J** means Japanese  
**H** means Hanguel (that is, Korean)  
**P** means simplified Chinese  
**T** means Taiwanese.

**Note:** CICS Client for Macintosh cannot be DBCS-enabled.

## CICS Client for DOS software requirements

### CICS Client for DOS software requirements

The following table lists the software requirements of CICS Client for DOS.

<i>Table 3 (Page 1 of 2). Software requirements for CICS Client for DOS</i>
<b>Operating System version</b>
One of: <ul style="list-style-type: none"><li>• Microsoft or IBM PC DOS 3.3, DOS 4.0, DOS 5.0, or later</li><li>• DOS J 4.0 or later</li><li>• DOS H 4.0 or later</li><li>• DOS T 4.0 or later</li><li>• DOS J 5.0/V or later</li><li>• DOS H 5.0/V or later</li><li>• DOS T 5.0/V or later</li></ul> A DOS client can also run in the “DOS box” of OS/2.
<b>NetBIOS support</b>
NetBIOS 3.0 support is provided by: <ul style="list-style-type: none"><li>• PC LAN Support Program Version 1.3</li></ul> To use CICS Client for DOS in a Novell NetWare LAN to communicate with CICS for OS/2, using NetBIOS emulation over IPX, the following is required: <ul style="list-style-type: none"><li>• Novell NetWare DOS Requester</li></ul> This product is packaged with Novell NetWare Version 3.11 and Version 4.0.
<b>TCP/IP support</b>
One of the following is required: <ul style="list-style-type: none"><li>• IBM TCP/IP for DOS Version 2.1.1 or later</li><li>• FTP Software's PC/TCP Network Software for DOS/Windows Version 2.3</li><li>• Novell LAN Workplace for DOS Version 4.2 Revision C</li><li>• DOS/Windows Access Kit supplied with Warp Connect, Warp Server, and TCP/IP for OS/2 Version 2.0 or later</li></ul>
<b>SNA support</b>

## CICS Client for DOS software requirements

Table 3 (Page 2 of 2). Software requirements for CICS Client for DOS

If a Novell NetWare LAN and gateway is being used for communication to the CICS server:

- Novell NetWare for SAA Version 1 Release 3 or later is required in the gateway workstation. The following levels of Version 1 Release 3 are required:

    COMMEEXEC level 1.3.46 or later  
    NWSAA level 1.3.60 or later.

In addition, the following fixes are required:

<b>Novell NetWare for SAA V1.3</b>	Server machines - fixes SAA008 and SAA023 Client machines - None
<b>Novell NetWare for SAA V2.0</b>	Server machines - latest available fixes Client machines - latest available fixes.

See the README.TXT file for information about the latest levels required.

- If you use NetWare for SAA V1.3, Attachmate's Novell 3270 LAN Workstation for DOS Version 3 or later is required in the client.

**Note:** Version 3.0.1 of this product cannot be used.

For communication with CICS/400 only:

- IBM Client Access/400 for DOS
- IBM Client Access/400 for DOS with Extended Memory

If you use a Token-Ring or Ethernet adaptor, and it is not included in your APPC-providing product, you require PC LAN Support Program at the current level.

### Application development language support

The following language compilers are supported:

- Micro Focus COBOL 3.0.54
- Microsoft C Version 6.0 or later
- Microsoft Visual C++ Version 1.0 or later
- Any compiler compatible with the above, though only these compilers have been tested by IBM

**Note:** Compilers may default to settings for Windows. You may therefore need to modify compiler settings for DOS-only applications.

## CICS Client for OS/2 software requirements

### CICS Client for OS/2 software requirements

The following table lists the software requirements of CICS Client for OS/2.

<b>Operating System version</b>
<p>Table 4 (Page 1 of 2). Software requirements for CICS Client for OS/2</p> <p>CICS Client for OS/2 can run under any of the following operating systems:</p> <ul style="list-style-type: none"><li>• IBM OS/2 Version 2.0 or later</li><li>• IBM OS/2 J Version 2.0 or later</li><li>• IBM OS/2 H Version 2.0 or later</li><li>• IBM OS/2 P Version 2.1 or later</li><li>• IBM OS/2 T Version 2.0 or later</li><li>• IBM OS/2 Version 3.0 (Warp) or later</li><li>• IBM OS/2 Warp Connect</li></ul>
<b>NetBIOS support</b>
<p>A product that provides the API of NetBIOS 3.0 or later is required. Such products include:</p> <ul style="list-style-type: none"><li>• OS/2 Warp Connect</li><li>• OS/2 Warp Server</li><li>• OS/2 LAN Server Version 2 or later</li><li>• IBM Network Transport Services/2</li></ul> <p>To use CICS Client for OS/2 in a Novell NetWare LAN to communicate with CICS for OS/2, using NetBIOS emulation over IPX, the following is required:</p> <ul style="list-style-type: none"><li>• Novell NetWare Requester for OS/2 Version 2.0.1, or later.</li></ul> <p>This product is packaged with Novell NetWare Version 3.11 and Version 4.0.</p>
<b>TCP/IP support</b>
<p>One of the following is required:</p> <ul style="list-style-type: none"><li>• OS/2 Warp Connect</li><li>• OS/2 Warp Server</li><li>• IBM TCP/IP for OS/2 Version 2.0 or later</li><li>• FTP Software's PC/TCP Network Software for OS/2 Version 1.3, or later</li><li>• Novell LAN Workplace for OS/2 Version 3.0 Revision A, or later</li></ul>
<b>SNA support</b>
<p>One of the following is required:</p> <ul style="list-style-type: none"><li>• The Communications Server member of the IBM software servers</li><li>• IBM Communications Manager/2 (CM/2) Version 1.0 or later</li></ul> <p>For TCP62 support, IBM eNetwork Communications Server for OS/2 Warp Version 5.0 is required.</p>
<b>SystemView for OS/2 support</b>
<p>If you are going to install CICS Client for OS/2 using SystemView for OS/2, you must have the following installed on each workstation on which you will install CICS Client for OS/2:</p> <ul style="list-style-type: none"><li>• OS/2 Warp Server</li><li>• SystemView for OS/2 client</li></ul>
<b>CICS Gateway for Java</b>
<p>CICS Gateway for Java will run on any Java-enabled platform with the Java Development Toolkit (JDK) Version 1.0.1 or later installed.</p>

## CICS Client for OS/2 software requirements

<i>Table 4 (Page 2 of 2). Software requirements for CICS Client for OS/2</i>
<b>CICS gateway for Lotus Notes and CICS Internet gateway</b>
For information on the hardware and software requirements of CICS gateway for Lotus Notes and CICS Internet gateway, refer to the <i>IBM CICS Clients Gateways</i> book.
<b>Application development language support</b>
The following language compilers are supported: <ul style="list-style-type: none"><li>• Micro Focus COBOL/2 Level 2.5, or later</li><li>• Microsoft C Version 6.0 (16-bit applications)</li><li>• IBM VisualAge for COBOL for OS/2 Version 1.0</li><li>• IBM C/2 Version 1.1</li><li>• IBM C Set/2 Version 1.0 (32-bit applications)</li><li>• IBM C Set ++ Version 2.1 or later (32-bit applications)</li><li>• IBM VisualAge for C++ for OS/2 Version 3.0</li><li>• IBM PL/I for OS/2 Version 1.1 Professional Edition</li><li>• OS/2 REXX</li><li>• Any other compiler compatible with the above, though only these compilers have been tested by IBM</li></ul>

## CICS Client for Windows 3.x software requirements

### CICS Client for Windows 3.x software requirements

The following table lists the software requirements of CICS Client for Windows.

<b>Operating System version</b>
<p>Table 5 (Page 1 of 2). Software requirements for CICS Client for Windows 3.x.</p> <p>CICS Client for Windows can run under any of the following operating systems:</p> <ul style="list-style-type: none"><li>• Windows Version 3.1, or later</li><li>• Windows J Version 3.1 or later</li><li>• Windows H Version 3.1 or later</li><li>• Windows T Version 3.1 or later</li><li>• Windows for Workgroups Version 3.1.1</li></ul> <p><b>Note:</b> CICS Client for Windows can also run in the 16-bit subsystem of Microsoft Windows NT Version 3.1 or later, and in the WIN-OS2 subsystem of IBM OS/2 Version 2.1 and later. However, some communication software products may not be compatible with CICS Client for Windows within these subsystems. For example, APPC Networking Services for Windows does not work in the WIN-OS2 subsystem. You are advised to check the documentation supplied with those products for restrictions (see "Publications" on page xix).</p>
<b>NetBIOS support</b>
<p>NetBIOS 3.0 support is provided by:</p> <ul style="list-style-type: none"><li>• PC LAN Support Program Version 1.3</li></ul> <p>NetBIOS support is also provided by Windows for Workgroups.</p> <p>To use CICS Client for Windows in a Novell NetWare LAN to communicate with CICS for OS/2, using NetBIOS emulation over IPX, the following is required:</p> <ul style="list-style-type: none"><li>• Novell NetWare DOS Requester</li></ul> <p>This product is packaged with Novell NetWare Version 3.11 and Version 4.0.</p>
<b>TCP/IP support</b>
<p>One of the following is required:</p> <ul style="list-style-type: none"><li>• IBM TCP/IP for DOS Version 2.1.1 or later</li><li>• FTP Software's PC/TCP Network Software for DOS/Windows Version 2.3</li><li>• Novell LAN Workplace for DOS Version 4.2 Revision C</li><li>• DOS/Windows Access Kit supplied with Warp Connect, Warp Server, and TCP/IP for OS/2 Version 2.0 or later</li><li>• Any vendor TCP/IP implementation that adheres to the Windows Socket API (WINSOCK); for example, Microsoft TCP/IP Winsock. Note however that only the above listed products have been tested by IBM.</li></ul> <p>TCP/IP support is also provided by Windows for Workgroups.</p>
<b>SNA support</b>

## CICS Client for Windows 3.x software requirements

Table 5 (Page 2 of 2). Software requirements for CICS Client for Windows 3.x.

APPC support is provided by:

- IBM APPC Networking Services for Windows Version 1.0 or later.
- Microsoft SNA Server Version 2.11, or later, with Service Pack 1 or later  
SNA Server Client must be installed on the CICS Client for Windows workstation.  
If CICS Client for Windows is run under Windows NT or Windows 95, it cannot use SNA Server.
- IBM Communications Server for Windows NT Version 5.0 or later  
Communications Server Client for Windows 3.1 must be installed on the CICS Client for Windows workstation.

If a Novell NetWare LAN and gateway is being used for communication to the CICS server:

- Novell NetWare for SAA Version 1 Release 3 or later is required in the gateway workstation. The following levels of Version 1 Release 3 are required:  
    COMMEEXEC level 1.3.46 or later  
    NWSAA level 1.3.60 or later.

In addition, the following fixes are required:

<b>Novell NetWare for SAA V1.3</b>	Server machines - fixes SAA008 and SAA023 Client machines - fix SAA012
<b>Novell NetWare for SAA V2.0</b>	Server machines - latest available fixes Client machines - latest available fixes

See the README.TXT file for information about the latest levels.

For communication with CICS/400 only:

- IBM Client Access/400 for Windows 3.1

If you use a Token-Ring or Ethernet adaptor, and it is not included in your APPC-providing product, you require PC LAN Support Program at the current level.

### Application development language support

The following language compilers are supported:

- Micro Focus COBOL Version 3.0.54 or later
- Microsoft C Version 6.0 or later
- Microsoft Visual C++ Version 1.0 or later
- Any other C compiler compatible with the above, though only these compilers have been tested by IBM



## CICS Client for Windows 95 software requirements

### CICS Client for Windows 95 software requirements

The following table lists the software requirements of CICS Client for Windows 95.

<i>Table 6. Software requirements for CICS Client for Windows 95</i>
<b>Operating System version</b>
CICS Client for Windows 95 can run under any of the following operating systems: <ul style="list-style-type: none"><li>• Windows 95</li></ul>
<b>NetBIOS support</b>
NetBIOS support is provided by Windows 95.
<b>TCP/IP support</b>
TCP/IP support is provided by Windows 95, however any vendor TCP/IP implementation that adheres to the Windows Socket API (WINSOCK); for example, Microsoft TCP/IP Winsock can be used.
<b>SNA support</b>
APPC support is provided by: <ul style="list-style-type: none"><li>• Microsoft SNA Server Version 2.11, or later, with Service Pack 1 or later SNA Server Client must be installed on the CICS Client for Windows 95 workstation.</li><li>• IBM Communications Server for Windows NT Version 5.0 or later Communications Server Client for Windows 95 must be installed on the CICS Client for Windows workstation.</li><li>• IBM Personal Communications for Windows 95 Version 4.2, or Version 4.1 with the following fix:<ul style="list-style-type: none"><li>– APAR IC17000</li></ul></li><li>• Novell NetWare for SAA: At the Netware for SAA server:<ul style="list-style-type: none"><li>– Novell NetWare Version 4.11.</li><li>– NetWare for SAA Version 2.2 installed with PTF SAA22010 applied; this is available from: <a href="http://www.networking.ibm.com/cms/nsa22.html">http://www.networking.ibm.com/cms/nsa22.html</a></li></ul>At the Netware for SAA Client:<ul style="list-style-type: none"><li>– Novell NetWare Client Version 4.11. <b>Note:</b> You must <b>not</b> install the NetWare Client support supplied with Windows NT.</li><li>– NetWare for SAA Version 2.2 client for Windows 95 shipped in PTF SAA22010, with APAR JR10793 applied.</li></ul></li></ul> For TCP62 support, IBM Personal Communications Version 4.2 or the Host TCP/IP Access Feature component of CICS Client for Windows 95 is required. See “Coexistence of TCP62 with SNA protocol on Windows NT/95” on page 93.
<b>Application development language support</b>
The following language compilers are supported: <ul style="list-style-type: none"><li>• Micro Focus COBOL Version 3.0.54 or later</li><li>• Microsoft Visual C++ Version 1.0 or later</li><li>• Any other C compiler compatible with the above, though only these compilers have been tested by IBM</li></ul>

## CICS Client for Windows NT software requirements

### CICS Client for Windows NT software requirements

The following table lists the software requirements of CICS Client for Windows NT.

<i>Table 7 (Page 1 of 2). Software requirements for CICS Client for Windows NT</i>
<b>Operating System version</b>
CICS Client for Windows NT can run under any of the following operating systems: <ul style="list-style-type: none"><li>• Windows NT Workstation Version 3.5, or later</li><li>• Windows NT Server Version 3.5, or later</li></ul>
<b>NetBIOS support</b>
NetBIOS support is provided by Windows NT.
<b>TCP/IP support</b>
TCP/IP support is provided by the Windows NT Workstation and Windows NT Server operating systems.
<b>SNA support</b>
APPC support is provided by: <ul style="list-style-type: none"><li>• Microsoft SNA Server Version 2.11, or later, with Service Pack 1 or later SNA Server itself may be installed on the workstation, or SNA Server Client may be installed on the CICS Client for Windows NT workstation.</li><li>• IBM Communications Server for Windows NT Version 5.0 or later Communications Server itself may be installed on the workstation, or Communications Server Client for Windows NT may be installed on the CICS Client for Windows NT workstation.</li><li>• IBM Personal Communications for Windows NT Version 4.2, or Version 4.1 with the following fix:<ul style="list-style-type: none"><li>– APAR IC16672</li></ul></li><li>• Novell NetWare for SAA: At the Netware for SAA server:<ul style="list-style-type: none"><li>– Novell NetWare Version 4.11.</li><li>– NetWare for SAA Version 2.2 installed with PTF SAA22010 applied; this is available from: <a href="http://www.networking.ibm.com/cms/nsa22.html">http://www.networking.ibm.com/cms/nsa22.html</a></li></ul>At the Netware for SAA Client:<ul style="list-style-type: none"><li>– Novell IntranetWare Client for Windows NT; this is available from: <a href="http://www.novell.com/novellsw/platform.html">http://www.novell.com/novellsw/platform.html</a> <b>Note:</b> You must <b>not</b> install the NetWare Client support supplied with Windows NT.</li><li>– NetWare for SAA Version 2.2 client for Windows NT shipped in PTF SAA22010, with APAR JR10793 applied.</li></ul></li></ul> <p>For TCP62 support, IBM Personal Communications Version 4.2 or the Host TCP/IP Access Feature component of CICS Client for Windows NT is required. See "Coexistence of TCP62 with SNA protocol on Windows NT/95" on page 93.</p>
<b>DCE support</b>

## CICS Client for Windows NT software requirements

<i>Table 7 (Page 2 of 2). Software requirements for CICS Client for Windows NT</i>
<ul style="list-style-type: none"><li>• IBM Distributed Computing Environment for Windows NT Version 1.1.1, or later</li><li>• Digital DCE for Windows NT Version 1.1.C</li><li>• Transarc DCE for Windows NT Version 1.1.C</li><li>• Gradient PC-DCE for Windows NT/95 Version 2.0</li></ul>
<b>CICS Gateway for Java</b>
CICS Gateway for Java will run on any Java-enabled platform with the Java Development Toolkit (JDK) Version 1.0.1 or later installed.
<b>CICS gateway for Lotus Notes and CICS Internet gateway</b>
For information on the hardware and software requirements of CICS gateway for Lotus Notes and CICS Internet gateway, refer to the <i>IBM CICS Clients Gateways</i> book.
<b>Application development language support</b>
The following language compilers are supported: <ul style="list-style-type: none"><li>• Micro Focus Object COBOL for Windows NT Version 3.3, or later</li><li>• Microsoft Visual C++ Version 1.10 (32-bit edition for Windows NT)</li><li>• Any other C compiler compatible with the above, though only these compilers have been tested by IBM</li></ul>

## CICS Client for Macintosh software requirements

The following table lists the software requirements of CICS Client for Macintosh.

<i>Table 8. Software requirements for CICS Client for Macintosh</i>	
<b>Operating System version</b>	
CICS Client for Macintosh can run under the following operating system:	
<ul style="list-style-type: none"><li>• Macintosh System 7.1 or later</li></ul> Apple Shared Library Manager (ASLM) Version 1.1.1 or later is also required.	
<b>NetBIOS support</b>	
Not available.	
<b>TCP/IP support</b>	
<ul style="list-style-type: none"><li>• MacTCP Version 2 or later</li></ul> MacTCP can be provided by the Apple TCP/IP Connection for Macintosh product.	
<b>SNA support</b>	
<ul style="list-style-type: none"><li>• Apple SNA•ps 3270 Gateway Client or SNA•ps 5250 Gateway Client</li><li>• Apple SNA•ps Gateway /10, /35, or /70 in the gateway machine</li></ul>	
<b>Application development language support</b>	
For CICS Client for Macintosh, only the C language is supported. The following compilers may be used:	
<ul style="list-style-type: none"><li>• Apple MPW C Version 3.31, or later</li><li>• Symantec C/C++ for MPW Version 6.01, or later</li><li>• Any C compiler that supports the Apple Shared Library Manager, though only the above compilers have been tested by IBM</li></ul>	

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## Code page support

Some CICS servers do not support some code pages that are supported by IBM CICS Clients.

If the code page of an ECI application is different from the code page of the server, data conversion must be performed at the CICS server. This would be the case with an EBCDIC CICS server such as CICS for MVS/ESA. With such servers you can use the DFHCNV macro to perform conversion. For more information, see the CICS server documentation and *CICS Clients Unmasked*.

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### Chapter 3. Installing CICS clients

This chapter describes the following:

- “Installing CICS clients” on page 36
- “Installing CICS Client for DOS” on page 38
- “Installing CICS Client for OS/2” on page 40
- “Installing CICS Client for Windows” on page 45
- “Installing CICS Client for Windows 95” on page 49
- “Installing CICS Client for Windows NT” on page 54
- “Installing CICS Client for Macintosh” on page 59
- “CICS clients directory structure” on page 61
- “Other actions required in setting up a CICS client” on page 67

This contains a section for each CICS client:

- “CICS Client for DOS”
- “CICS Client for OS/2”
- “CICS Client for Windows”
- “CICS Client for Windows 95”
- “CICS Client for Windows NT”
- “CICS Client for Macintosh”

This chapter describes how to install CICS clients. The components of CICS clients that you can choose to install are:

- CICS Client runtime system
- CICS Client programming samples
- CICS Client documentation

The following components are also available with CICS Client for OS/2 and CICS Client for Windows NT:

- CICS gateway for Lotus Notes
- CICS Internet gateway
- CICS Gateway for Java.

The following component is available with CICS Client for Windows 95 and CICS Client for Windows NT:

- CICS Host TCP/IP Access Feature

You install this component or not depending on how you want the TCP62 and SNA protocols to coexist. For more information, see “TCP62 configuration” on page 91.

You can install the CICS client system code as a minimum, and install the other components later.

## Installing CICS clients

The installation processes allow you to select the language in which end-user messages are displayed.

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### Installing CICS clients

You can download CICS clients from the following Web site:  
<http://service.software.ibm.com/dl/cclient204/ccli204-w>

You should pay close attention to the licensing conditions mentioned on this Web site.

Follow the instructions for downloading the client software. The clients are downloaded as self-extracting .EXE files. (Except CICS Client for DOS and CICS Client for Macintosh, which are downloaded as a diskette image.)

When you have extracted the CICS clients, you will have an INSTALL.EXE program on your hard disk. You can now proceed with installation as described in:

- “Installing CICS Client for DOS” on page 38
- “Installing CICS Client for OS/2” on page 40
- “Installing CICS Client for Windows” on page 45
- “Installing CICS Client for Windows 95” on page 49
- “Installing CICS Client for Windows NT” on page 54

For CICS Client for DOS and CICS Client for Macintosh you must first create an installation diskette, see “Installing from diskette” on page 37.

**Note:** Due to the size restriction on diskette images, the TCP62 function of CICS Client for Windows NT and CICS Client for Windows 95 was not included if you installed Version 2.0.2 from the Web site. The TCP62 function is now included with CICS clients Version 2.0.3 and later on the Web site.

### Installing from a CD-ROM

Some releases of CICS clients are provided on CD-ROM. The CD-ROM contains subdirectories of \DOS, \OS2, \WIN, \W95, and \WNT. These directories contain an INSTALL.EXE program and software for the different types of client.

You can install directly from the CD-ROM, from the CD-ROM drive of a remote machine, or from a network drive to which the appropriate client directory has been copied. To connect to the appropriate drive, issue a NET USE command, for example:

```
NET USE F: \\CICSCLI\INSTALL
```

where F: is the drive on the remote machine, and CICSCLI\INSTALL are the servername and netname assigned by your network administrator.

## Installing CICS clients

### Installing from diskette

If you need to install your CICS clients from diskette, you must obtain the diskette image from the Web site (see “Installing CICS clients” on page 36) or from a CD-ROM package.

To create installation diskettes:

1. Insert a diskette in a diskette drive in the machine, (usually A:).
2. Change to the directory containing the diskette image. (This is the \DISKS directory on a CD-ROM)
3. Issue LOADDSKF commands to create the installation diskettes:

```
LOADDSKF CCLcli.DSK A:
```

where *cli* identifies the type of client and *nn* identifies the number of the diskette.

For example:

```
LOADDSKF CCLMAC_1.DSK A:
```

would create the first installation diskette for CICS Client for Macintosh.

For help information on the LOADDSKF command enter LOADDSKF on its own.

4. Insert the installation diskette in the diskette drive in the client machine and install as described in the relevant section in this chapter.

## CICS Client for DOS installation

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### Installing CICS Client for DOS

If you want to install over a LAN, you can either:

- First install CICS Client for DOS onto the network drive, and allow the users to copy the directories and files to their workstation, or
- Copy the CICS Client for DOS INSTALL.EXE program and software to the root directory of the network drive, and allow the users to install from the network drive.

### The installation procedure

To install CICS Client for DOS:

1. Change to the drive containing the INSTALL.EXE program.
2. If installing from CD-ROM, copy the files from the CD-ROM into the root directory of the drive where you want to install the client.
3. At the command prompt, type INSTALL, then press the Enter key. An introductory CICS clients panel is displayed. Press any key other than Esc to continue. (During the installation process, you can press the Esc key at any time to terminate the installation.)
4. A welcome panel is displayed. Press any key other than Esc to continue.
5. Select the drive onto which you would like CICS Client for DOS installed (the default is C:). Move the bar to your selection, and then press the Enter key.
6. Select the path that you want CICS Client for DOS to be installed under. The default is \CICSCLI. If you select a path that already exists, you are asked whether you want to select another path, terminate the installation, or continue installing into the existing path. If you install into the existing path, files will be overwritten.
7. Select the components of CICS Client for DOS that you want to install. Move the highlight to each required component in turn, and press the spacebar to toggle the component from "NO" to "YES". When you have selected all the components that you want to install, press Enter. (You are informed if you do not have enough disk space to install the selected components.)
8. Select the language in which the CICS Client for DOS messages are to be displayed. Move the highlight to the language of choice, and then press Enter to complete the selection.
9. An installation progress panel is displayed. If the CICS Client for DOS initialization (.INI) files already exist in the \BIN subdirectory of the directory you selected for installation, the original files are renamed to:

CICSCLI.BAK,  
CICSCL.BAK, and  
CICSKEY.BAK

in the \BIN subdirectory of the directory selected for installation.



## CICS Client for DOS installation

10. You are asked whether you want the installation process to update the AUTOEXEC.BAT file. If you select this option, your original AUTOEXEC.BAT file, is renamed AUTOEXEC.BAK and is stored in the same directory.
11. If your AUTOEXEC.BAT file has been updated, remove any diskette, shut down the system and restart. If the AUTOEXEC.BAT file was not updated, before shutting down the system, update the PATH statement with:

`x:\path\BIN`

where *x* is the drive, and *path* is the path you selected.

It is important to read the README.TXT file supplied with CICS Client for DOS.

### Updating your CICS Client for DOS system

To update your CICS clients system with new service levels, you use corrective service software. Corrective service software allows you to service an installed CICS clients system with the latest level of software.

To install corrective service, proceed in the same way as for installing CICS Client for DOS. Remember to read the README file supplied with the corrective service software.

Updating an installed CICS client system causes the client initialization file, keyboard mapping file, and color mapping file, to be overwritten. Although these files are backed up, it is recommended that you keep your own customized versions of these files with different names to those supplied. You should then reference these customized files by environment variables see "Renaming the client initialization and mapping files" on page 139.

### Deleting your CICS Client for DOS system

To delete your system, you should delete all of the CICS Client for DOS directories and all files contained in those directories. You must also delete all entries for CICS Client for DOS from the AUTOEXEC.BAT file.

## CICS Client for OS/2 installation

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### Installing CICS Client for OS/2

This section describes the process of installing CICS Client for OS/2 interactively. It is also possible to install CICS Client for OS/2 using a response file, see “Automatic installation of CICS Client for OS/2” on page 44.

Online help is available throughout the installation process, by selecting the **Help** push button or by pressing PF1.

**Note:** If you have a previous version of CICS Client for OS/2 installed, you should either install CICS Client for OS/2 Version 2.0.1 to the same directory as the older version, or uninstall the older version first. If you do not want to remove or replace the older version of CICS Client for OS/2 you must ensure that the correct dynamic link libraries (DLL) are used for each version. If CICS Client for OS/2 loads a DLL from an older version, traps will occur.

Before you start, make sure that you have at least 150 KB of free space on the drive containing the operating system. This is required by the installation program.

### The installation procedure

1. Change to the drive containing the INSTALL.EXE program.
2. At the command prompt, type INSTALL, then press the Enter key. After the files are loaded, an introductory CICS clients panel is displayed.
3. To proceed, click on the **Continue** push button, or press the Enter key.  
The Install panel is displayed.
4. If you select the check box to update the CONFIG.SYS file, the file is updated automatically as part of the installation process. Your original CONFIG.SYS file is renamed to CONFIG.BAK and is stored in the same directory. If you do not select this check box, a CONFIG.ADD file is generated, containing the necessary updates to the LIBPATH or PATH statements in CONFIG.SYS.
5. Select the **OK** push button to continue. The Install—directories panel is displayed.
6. The list box shows the installation options that you can select. When you select one or more of these options, the **Bytes needed** field shows the amount of disk space required for installation. If there is too little space on your hard disk for the CICS client installation, an action message appears before the Install—directories panel. In this case, cancel the installation by selecting the **OK** push button. Find out which of your existing files you can archive or delete to make more space before proceeding further.

Use the push buttons as necessary:

- To display descriptions of the selected options, select **Descriptions**.
- To select all of the options, select **Select all**.
- To deselect all of the options, select **Deselect all**.

The **High-Level Directory** entry field allows you to specify a drive and directory other than the default (C:\CICSCLI) for installation.

## CICS Client for OS/2 installation

7. To show how much disk space is available on each drive, select the **Disk space** push button. The Disk space panel is displayed.

The list box shows the amount of available disk space for each drive, and whether installation is possible. Select a drive from the list box if required. When you return to the Install—directories panel, your selected drive is shown in the **High-Level Directory** field.

8. Select the **Install** push button to continue. An Installation progress panel is displayed. The panel shows:
  - The file currently being installed (source) and the drive and directory to which it is being installed (target)
  - A progress bar, indicating the percentage of files already unpacked and installed
  - The elapsed time
  - The status, for example, unpacking, processing, or transferring

If you select the **Stop** push button, you are asked whether you want to delete the partial system you have installed. Select **Yes** to delete the files already installed and return to the introductory CICS Client for OS/2 panel. Then, select **Start install** from the **File** menu to start the installation again.

9. A panel allowing you to select the language in which CICS client messages are displayed appears. Choose the required language and select **OK**.
10. **Diskette installation only:** Insert the second installation diskette when you are prompted.
11. When installation is complete, the Installation and Maintenance panel is displayed. Select **OK**.
12. When the installation process is complete, an OS/2 desktop folder is created (see Figure 26 on page 166). In a fully installed system, the folder contains icons for:
  - The README.TXT file
  - Starting the client
  - Stopping the client
  - Showing the client status
  - Starting the terminal emulator
  - Starting the printer emulator
  - The installation and maintenance program
  - The CICS clients online documentation (optional)
13. If your CONFIG.SYS file has been updated, remove any diskette, shut down the system and restart. If the file was not updated rename the CONFIG.ADD file to CONFIG.SYS before shutting down the system. (CONFIG.ADD will be in the same directory as CONFIG.SYS.)

## CICS Client for OS/2 installation

### CAUTION:

Be very careful if you are installing CICS Client for OS/2 onto a workstation that already has a CICS for OS/2 server installed. Both products have some files of the same name, therefore you must ensure that the installation of the client does not affect the server. This is particularly important with respect to the LIBPATH setting. It is not recommended that you install both CICS client and CICS for OS/2 server on the same workstation, unless you are a software developer familiar with problems of this sort.

## Updating your CICS Client for OS/2 system

This section describes how you update your CICS client system with new service levels. This is done using corrective service software, which allows you to service an installed CICS client system with the latest level of software. You can install the corrective service software:

- Interactively, by running the installation and maintenance program from the icon in the CICS client folder
- Automatically, using a response file (see “Automatic installation of CICS Client for OS/2” on page 44)

### The installation and maintenance program

When a CICS client is installed, the installation and maintenance program is installed along with the product software.

The icon for the installation and maintenance program is displayed in the CICS client folder. From this icon you can run the program to maintain all installed CICS client systems. The installation and maintenance program allows you to:

- Install new CICS client systems, and additional CICS client components
- Update installed CICS client systems
- Restore backed up CICS client systems
- Delete installed CICS client systems

You can update from diskette or from a redirected LAN drive.

### The update process

The installation and maintenance program works with catalogs of products. A catalog contains a list of products; when you open a catalog, the installation and maintenance program lists the products that it contains. Before you update CICS Client for OS/2, you must open the catalog for CICS Client for OS/2 and select the required product.

The process is as follows:

1. Click on the **Installation Utility** icon in the CICS Client for OS/2 folder. The installation and maintenance program starts, and displays the main panel.
2. Select the **File** action, followed by the **Open catalog** option from the pull-down menu.

## CICS Client for OS/2 installation

3. Now, select the **Drive** option. The Open drive catalog panel is displayed and this allows you to select the drive containing the corrective service software. When you select the drive, the catalog file (for example, CCLCLNT.ICF) is listed under **Filename**. Select the appropriate drive and open the catalog. The products in the catalog are listed.
4. Make sure that the correct service level of CICS Client for OS/2 is selected in the list of products.  
  
Make sure that you will have enough disk space for the product components you want to update, and any that you want to back up.
5. Select the **Update** action from the **Action** menu. The Update panel is displayed.
6. If you select the check box to update the CONFIG.SYS file, the file is updated automatically as part of the installation process. Your original CONFIG.SYS file is renamed to CONFIG.BAK and is stored in the same directory. If you do not select this check box, a CONFIG.ADD file is generated containing the necessary updates to the LIBPATH statement in the CONFIG.SYS file.
7. If you select the **Save a backup version** check box, the system being replaced by the application of the corrective service software is backed up. The backed up system can later be restored to the previous service level by selecting the **Restore** option from the **Action** menu. This gives you the chance to check that the updated system works correctly before you delete the old system.
8. Select the **Update** push button. The installation and maintenance program unpacks and copies the modules from the corrective service software to the installed system.

Updating an installed CICS client system causes the client initialization file, keyboard mapping file, and color mapping file, to be overwritten. Although these files are backed up, it is recommended that you keep your own customized versions of these files with different names to those supplied. You should then reference these customized files by environment variables see "Renaming the client initialization and mapping files" on page 139.

### Deleting a CICS Client for OS/2 system

To delete a CICS client system, make sure it is not running and perform the following:

1. Use the Installation Utility to open the catalog used to install the system. If you use the catalog you used for updating, only the files transferred from the corrective service software are deleted.
2. Select the **Delete** option from the **Actions** menu. The Delete panel is displayed.
3. Select the components you want to delete. To select or deselect all of the components, click on **Select** or **Deselect** respectively. If you want to delete only the backup versions, select the **Delete only the backup versions** check box.
4. Select the **Delete** push button. A progress panel is displayed, showing the proportion of files already deleted. You can select the **Stop** push button to stop the deletion.

## CICS Client for OS/2 installation

**Attention:** When you mark components for deletion it is not possible to delete some files immediately, because they are in use. You **must** therefore shut down and restart the system. The files are then deleted when the system is restarted.

### Automatic installation of CICS Client for OS/2

You can perform automatic installation and maintenance of CICS Client for OS/2 by supplying the required options in a *response file*. It is therefore possible to install CICS clients on workstations without user interaction being required at the workstation.

This kind of automatic installation is particularly useful for installing CICS clients over a network because installation can be performed from a redirected drive on a LAN server. (Refer to the documentation for your network operating system if you need to know how to connect to network drives.)

To start the installation, call the installation program by entering `INSTALL` together with the required parameters. For example:

```
INSTALL /A:I /R:F:\INSTCICS\CICSCLI.RSP
/S:F:\INSTCICS
/L1:F:\INSTCICS\CICSCLI.OUT
/L2:F:\INSTCICS\CICSCLI.HIS /X
```

In this example, CICS Client for OS/2 is installed from the redirected drive F: on the server, according to the options supplied in the response file `CICSCLI.RSP`. The response file specifies the drive and directory in which to install CICS Client for OS/2. Errors are logged in `CICSCLI.OUT` and the history log is contained in `CICSCLI.HIS`. The `/X` parameter specifies that the installation is noninteractive.

**Note:** The base level of CICS Client for OS/2 is installed using the `INSTALL` command, while corrective service software is installed using the `EPFINSTS` command.

The installation and maintenance parameters are described in “The installation and maintenance parameters” on page 240.

## CICS Client for Windows installation

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### Installing CICS Client for Windows

This section describes the process of installing CICS Client for Windows interactively. It is also possible to install CICS Client for Windows using a response file, see “Automatic installation of CICS Client for Windows” on page 49.

Online help is available throughout the process, by selecting the **Help** push button or by pressing PF1. It is important to browse through the README.TXT file provided on the installation diskette before you start the installation.

**Note:** During installation CICS Client for Windows creates a Windows Program Manager group to contain the CICS Client for Windows icons. However, if you are using an alternative Windows shell, the group may not be created correctly. In such cases you must ensure that the standard Windows Program Manager (PROGMAN.EXE) is running before starting installation.

Before you start, make sure that you have at least 150 KB of free space on the drive containing the operating system. This is required by the installation program.

### The installation procedure

1. Select the **Run** option of the **File** pulldown menu.
2. Enter `d:INSTALL`  
where *d*: is the drive containing the INSTALL program.  
After the files are loaded, an introductory CICS clients panel is displayed.
3. To proceed, click on the **Continue** push button, or press the Enter key.  
The Install panel is displayed.
4. If you select the check box to update the AUTOEXEC.BAT file, the file is updated automatically as part of the installation process. Your original AUTOEXEC.BAT file is renamed to AUTOEXEC.BAK and is stored in the same directory. If you do not select this check box, an AUTOEXEC.ADD file is generated, containing the necessary updates to the PATH statement in the AUTOEXEC.BAT file.
5. Select the **Overwrite files** check box to automatically replace all workstation files that have the same name and location as the product files being installed. If you do not select this check box, the installation and maintenance utility programs will warn you before overwriting an existing workstation file.
6. Select the **OK** push button to continue. The Install—directories panel is displayed.
7. The list box shows the installation options that you can select. When you select one or more of these options, the **Bytes needed** field shows the amount of disk space required for installation. If there is too little space on your hard disk for the installation, an action message appears before the Install—directories panel. In this case, cancel the installation by selecting the **OK** push button. Find out which of your existing files you can archive or delete to make more space before proceeding further.

Use the push buttons as necessary:

## CICS Client for Windows installation

- To display descriptions of the selected options, select **Descriptions**.
- To select all of the options, select **Select all**.
- To deselect all of the options, select **Deselect all**.

The **High-Level Directory** entry field allows you to specify a drive and directory other than the default (C:\CICSCLI) for installation.<sup>1</sup>

8. To show how much disk space is available on each drive, select the **Disk space** push button. The Disk space panel is displayed.

The list box shows the amount of available disk space for each drive, and whether installation is possible. Select a drive from the list box if required. If you also select the **Change directories to selected drive** check box, when you return to the Install—directories panel, your selected drive is shown in the **High-Level Directory** field.

9. Select the **Install** push button to continue. An Installation progress panel is displayed. The panel shows:
  - The file currently being installed (source) and the drive and directory to which it is being installed (target)
  - A progress bar, indicating the number of files already unpacked and installed
  - The elapsed time
  - The status, for example, unpacking, processing, or transferring

If you select the **Stop** push button, you are asked whether you want to delete the partial system you have installed. Select **Yes** to delete the files already installed and return to the introductory CICS clients panel. Then, select **Start install** from the **File** menu to start the installation again.

10. A panel allowing you to select the language in which CICS clients messages are displayed is shown. Choose the required language and select **OK**.
11. **Diskette installation only:** Insert the next installation diskette when you are prompted.
12. When installation is complete, the Installation and Maintenance panel is displayed. Select **OK**.
13. When the installation process is complete, a Windows Program Manager group (see Figure 27 on page 167) is created. In a fully installed system, the group window contains icons for:
  - The README.TXT file
  - Starting the client
  - Stopping the client
  - Showing the client status
  - Starting the terminal emulator
  - Starting the printer emulator
  - The installation and maintenance program

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<sup>1</sup> If installing in WIN-OS2, you cannot specify directory names longer than 8 characters.



## CICS Client for Windows installation

- The CICS clients online documentation (optional)
14. If your AUTOEXEC.BAT file has been updated, remove any diskette, shut down the system, and restart. If the file was not updated, rename AUTOEXEC.ADD to AUTOEXEC.BAT before shutting down the system. (AUTOEXEC.ADD will be in the same directory as AUTOEXEC.BAT.)

### Updating your CICS Client for Windows system

This section describes how you update your CICS Client for Windows system with new service levels. This is done using corrective service software which allows you to service an installed CICS clients system with the latest level of software. You can install the corrective service software:

- Interactively, by running the installation and maintenance program from the icon in the CICS client group.
- Automatically, using a response file (see “Automatic installation of CICS Client for Windows” on page 49).

### The installation and maintenance program

When a CICS client is installed, the installation and maintenance program is installed along with the product software.

The icon for the installation and maintenance program is displayed in the CICS Client for Windows group. From this icon you can run the program to maintain all installed CICS clients systems. The installation and maintenance program allows you to:

- Install new CICS client systems, and additional CICS client components
- Update installed CICS client systems
- Restore backed up CICS client systems
- Delete installed CICS client systems

You can update from diskette or from a redirected LAN drive.

### The update process

The installation and maintenance program works with catalogs of products. A catalog contains a list of products; when you open a catalog, the installation and maintenance program lists the products that it contains. Before you update CICS Client for Windows you must open the catalog for CICS Client for Windows and select the required product.

The process is as follows:

1. Click on the **Installation Utility** icon in the CICS Client for Windows group. The installation and maintenance program starts, and displays the main panel.
2. Select the **File** action, followed by the **Open catalog** option from the pulldown menu.
3. Now, select the **Drive** option. The Open drive catalog panel is displayed and this allows you to select the drive containing the corrective service software. When you select the drive, the catalog file (for example, CCLCLNT.ICF) is listed under

## CICS Client for Windows installation

**Filename.** Select the appropriate drive and open the catalog. The products in the catalog are listed.

4. Make sure that the correct service level of CICS client is selected in the list of products.

Make sure that you will have enough disk space for the product components you want to update, and any that you want to back up.

5. Select the **Update** action from the **Action** menu. The Update panel is displayed.
6. If you select the check box to update the AUTOEXEC.BAT file, the file is updated automatically as part of the installation process. Your original AUTOEXEC.BAT file is renamed to AUTOEXEC.BAK and is stored in the same directory. If you do not select this check box, an AUTOEXEC.ADD file is generated, containing the necessary updates to the PATH statement in the AUTOEXEC.BAT file.
7. If you select the **Save a backup version** check box, the system being replaced by the application of the corrective service software is backed up. The backed up system can later be restored to the previous service level by selecting the **Restore** option from the **Action** menu. This gives you the chance to check that the updated system works correctly before you delete the old system.
8. Select the **Update** push button. The installation and maintenance program unpacks and copies the modules from the corrective service software to the installed system.

Updating an installed CICS client system causes the client initialization file, keyboard mapping file, and color mapping file, to be overwritten. Although these files are backed up, it is recommended that you keep your own customized versions of these files with different names to those supplied. You should then reference these customized files by environment variables see "Renaming the client initialization and mapping files" on page 139.

## Deleting a CICS Client for Windows system

Before deleting a CICS Client for Windows system, make sure that the client itself is not running. (If a file to be deleted is in use, the delete process stops.)

To delete a CICS Client for Windows system:

1. Use the Installation utility to open the catalog used to install the system. If you use the catalog you used for updating, only the files transferred from the corrective service software are deleted.
2. Select the **Delete** option from the **Actions** menu. The Delete panel is displayed.
3. Select the components you want to delete. To select or deselect all of the components, click on **Select** or **Deselect** respectively. If you want to delete only the backup versions, select the **Delete only the backup versions** check box.
4. Select the **Delete** push button. A progress panel is displayed, showing the proportion of files already deleted. You can select the **Stop** push button to stop the deletion.

## CICS Client for Windows 95 installation

**Attention:** When you mark components for deletion it is not possible to delete some files immediately, because they are in use. The files that cannot be deleted are removed by running the EPFIDEFI.BAT file, which is placed in the root directory of the drive containing the operating system.

### Automatic installation of CICS Client for Windows

You can perform automatic installation and maintenance of CICS Client for Windows by supplying the required options in a *response file*. It is therefore possible to install CICS Client for Windows on workstations without user interaction being required at the workstation.

This kind of automatic installation is particularly useful for installing CICS Client for Windows over a network because installation can be performed from a redirected LAN drive. (Refer to the documentation for your network operating system if you need to know how to connect to network drives.)

To start the installation, call the installation program by entering `INSTALL` together with the required parameters. For example:

```
INSTALL /A:I /R:F:\INSTCICS\CICSCLI.RSP
/S:F:\INSTCICS
/L1:F:\INSTCICS\CICSCLI.OUT
/L2:F:\INSTCICS\CICSCLI.HIS /X
```

In this example, CICS Client for Windows is installed from the redirected drive F: on the server, according to the options supplied in the response file `CICSCLI.RSP`. The response file specifies the drive and directory in which to install CICS Client for Windows. Errors are logged in `CICSCLI.OUT` and the history log is contained in `CICSCLI.HIS`. The `/X` parameter specifies that the installation is noninteractive.

**Note:** The base level of CICS Client for Windows is installed using the `INSTALL` command, while corrective service software is installed using the `EPFINSTS` command.

The installation and maintenance parameters are described in “The installation and maintenance parameters” on page 240.

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### Installing CICS Client for Windows 95

This section describes the process of installing CICS Client for Windows 95 interactively. It is also possible to install CICS Client for Windows 95 using a response file, see “Automatic installation of CICS Client for Windows 95” on page 53.

Online help is available throughout the process, by selecting the **Help** push button or by pressing PF1. It is important to browse through the `README.TXT` file provided on the installation diskette before you start the installation.

Before you start, make sure that you have at least 150 KB of free space on the drive containing the operating system. This is required by the installation program.

## CICS Client for Windows 95 installation

### The installation procedure

1. Select **Run** from the **Start** menu.
2. Enter `d:INSTALL`  
where *d*: is the drive containing the INSTALL program.  
After the files are loaded, an introductory CICS clients panel is displayed.
3. To proceed, click on the **Continue** push button, or press the Enter key.  
The Install panel is displayed.
4. Select the **Overwrite files** check box to automatically replace all workstation files that have the same name and location as the product files being installed. If you do not select this check box, the installation and maintenance utility programs will warn you before overwriting an existing workstation file.
5. Select the **OK** push button to continue. The Install—directories panel is displayed.
6. The list box shows the installation options that you can select. When you select one or more of these options, the **Bytes needed** field shows the amount of disk space required for installation. If there is too little space on your hard disk for the installation, an action message appears before the Install—directories panel. In this case, cancel the installation by selecting the **OK** push button. Find out which of your existing files you can archive or delete to make more space before proceeding further.  
Use the push buttons as necessary:
  - To display descriptions of the selected options, select **Descriptions**.
  - To select all of the options, select **Select all**.
  - To deselect all of the options, select **Deselect all**.The **High-Level Directory** entry field allows you to specify a drive and directory other than the default (C:\CICSCLI) for installation.<sup>1</sup>
7. To show how much disk space is available on each drive, select the **Disk space** push button. The Disk space panel is displayed.  
The list box shows the amount of available disk space for each drive, and whether installation is possible. Select a drive from the list box if required. If you also select the **Change directories to selected drive** check box, when you return to the Install—directories panel, your selected drive is shown in the **High-Level Directory** field.
8. Select the **Install** push button to continue. An Installation progress panel is displayed. The panel shows:
  - The file currently being installed (source) and the drive and directory to which it is being installed (target)
  - A progress bar, indicating the number of files already unpacked and installed
  - The elapsed time
  - The status, for example, unpacking, processing, or transferring

## CICS Client for Windows 95 installation

If you select the **Stop** push button, you are asked whether you want to delete the partial system you have installed. Select **Yes** to delete the files already installed and return to the introductory CICS clients panel. Then, select **Start install** from the **File** menu to start the installation again.

9. A panel allowing you to select the language in which CICS clients messages are displayed is shown. Choose the required language and select **OK**.
10. **Diskette installation only:** Insert the next installation diskette when you are prompted.
11. When installation is complete, the Installation and Maintenance panel is displayed. Select **OK**.
12. When the installation process is complete, a Windows 95 folder is created. In a fully installed system, the folder contains icons for:
  - The READ ME file
  - Starting the client
  - Stopping the client
  - Showing the client status
  - Starting the terminal emulator
  - Starting the printer emulator
  - The installation and maintenance program
  - The CICS clients online documentation (optional)

### Updating your CICS Client for Windows 95 system

This section describes how you update your CICS Client for Windows 95 system with new service levels. This is done using corrective service software which allows you to service an installed CICS clients system with the latest level of software. You can install the corrective service software:

- Interactively, by running the installation and maintenance program from the icon in the CICS client folder.
- Automatically, using a response file (see "Automatic installation of CICS Client for Windows 95" on page 53).

### The installation and maintenance program

When a CICS client is installed, the installation and maintenance program is installed along with the product software.

The icon for the installation and maintenance program is displayed in the CICS Client for Windows 95 folder. From this icon you can run the program to maintain all installed CICS clients systems. The installation and maintenance program allows you to:

- Install new CICS client systems, and additional CICS client components
- Update installed CICS client systems
- Restore backed up CICS client systems
- Delete installed CICS client systems

You can update from diskette or from a redirected LAN drive.

## CICS Client for Windows 95 installation

### The update process

The installation and maintenance program works with catalogs of products. A catalog contains a list of products; when you open a catalog, the installation and maintenance program lists the products that it contains. Before you update CICS Client for Windows 95, you must open the catalog for CICS Client for Windows 95 and select the required product.

The process is as follows:

1. Click on the **Installation Utility** icon in the CICS Client for Windows 95 folder. The installation and maintenance program starts, and displays the main panel.
2. Select the **File** action, followed by the **Open catalog** option from the pulldown menu.
3. Now, select the **Drive** option. The Open drive catalog panel is displayed and this allows you to select the drive containing the corrective service software. When you select the drive, the catalog file (for example, CCLCLNT.ICF) is listed under **Filename**. Select the appropriate drive and open the catalog. The products in the catalog are listed.
4. Make sure that the correct service level of CICS client is selected in the list of products.  
  
Make sure that you will have enough disk space for the product components you want to update, and any that you want to back up.
5. Select the **Update** action from the **Action** menu. The Update panel is displayed.
6. If you select the **Save a backup version** check box, the system being replaced by the application of the corrective service software is backed up. The backed up system can later be restored to the previous service level by selecting the **Restore** option from the **Action** menu. This gives you the chance to check that the updated system works correctly before you delete the old system.
7. Select the **Update** push button. The installation and maintenance program unpacks and copies the modules from the corrective service software to the installed system.

Updating an installed CICS client system causes the client initialization file, keyboard mapping file, and color mapping file, to be overwritten. Although these files are backed up, it is recommended that you keep your own customized versions of these files with different names to those supplied. You should then reference these customized files by environment variables see "Renaming the client initialization and mapping files" on page 139.

### Deleting a CICS Client for Windows 95 system

Before deleting a CICS Client for Windows 95 system, make sure that the client itself is not running. (If a file to be deleted is in use, the delete process stops.)

To delete a CICS Client for Windows 95 system:

## CICS Client for Windows 95 installation

1. Use the Installation utility to open the catalog used to install the system. If you use the catalog you used for updating, only the files transferred from the corrective service software are deleted.
2. Select the **Delete** option from the **Actions** menu. The Delete panel is displayed.
3. Select the components you want to delete. To select or deselect all of the components, click on **Select** or **Deselect** respectively. If you want to delete only the backup versions, select the **Delete only the backup versions** check box.
4. Select the **Delete** push button. A progress panel is displayed, showing the proportion of files already deleted. You can select the **Stop** push button to stop the deletion.

**Attention:** When you mark components for deletion it is not possible to delete some files immediately, because they are in use. The files that cannot be deleted are removed by running the EPFIDEFI.BAT file, which is placed in the root directory of the drive containing the operating system.

### Automatic installation of CICS Client for Windows 95

You can perform automatic installation and maintenance of CICS Client for Windows 95 by supplying the required options in a *response file*. It is therefore possible to install CICS Client for Windows 95 on workstations without user interaction being required at the workstation.

This kind of automatic installation is particularly useful for installing CICS Client for Windows 95 over a network because installation can be performed from a redirected LAN drive. (Refer to the documentation for your network operating system if you need to know how to connect to network drives.)

To start the installation, call the installation program by entering `INSTALL` together with the required parameters. For example:

```
INSTALL /A:I /R:F:\INSTCICS\CICSCLI.RSP
/S:F:\INSTCICS
/L1:F:\INSTCICS\CICSCLI.OUT
/L2:F:\INSTCICS\CICSCLI.HIS /X
```

In this example, CICS Client for Windows 95 is installed from the redirected drive F: on the server, according to the options supplied in the response file `CICSCLI.RSP`. The response file specifies the drive and directory in which to install CICS Client for Windows 95. Errors are logged in `CICSCLI.OUT` and the history log is contained in `CICSCLI.HIS`. The `/X` parameter specifies that the installation is noninteractive.

**Note:** The base level of CICS Client for Windows 95 is installed using the `INSTALL` command, while corrective service software is installed using the `EPFINSTS` command.

The installation and maintenance parameters are described in “The installation and maintenance parameters” on page 240.

## CICS Client for Windows NT installation

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### Installing CICS Client for Windows NT

This section describes the process of installing CICS Client for Windows NT interactively. It is also possible to install CICS Client for Windows NT using a response file, see “Automatic installation of CICS Client for Windows NT” on page 58.

Online help is available throughout the process, by selecting the **Help** push button or by pressing PF1. It is important to browse through the README.TXT file provided on the installation diskette before you start the installation.

**Note:** During installation CICS Client for Windows NT creates a Windows Program Manager group to contain the CICS Client for Windows NT icons. However, if you are using an alternative Windows shell, the group may not be created correctly. In such cases you must ensure that the standard Windows Program Manager (PROGMAN.EXE) is running before starting installation.

Before you start, make sure that you have at least 150 KB of free space on the drive containing the operating system. This is required by the installation program.

### The installation procedure

1. Select **Run** from the **Start** menu.
2. Enter `d:INSTALL`  
where *d*: is the drive containing the INSTALL program. After the files are loaded, an introductory CICS clients panel is displayed.
3. To proceed, click on the **Continue** push button, or press the Enter key.  
The Install panel is displayed.
4. Select the **Overwrite files** check box to automatically replace all workstation files that have the same name and location as the product files being installed. If you do not select this check box, the installation and maintenance utility programs will warn you before overwriting an existing workstation file.
5. Select the **OK** push button to continue. The Install—directories panel is displayed.
6. The list box shows the installation options that you can select. When you select one or more of these options, the **Bytes needed** field shows the amount of disk space required for installation. If there is too little space on your hard disk for the installation, an action message appears before the Install—directories panel. In this case, cancel the installation by selecting the **OK** push button. Find out which of your existing files you can archive or delete to make more space before proceeding further.

Use the push buttons as necessary:

- To display descriptions of the selected options, select **Descriptions**.
- To select all of the options, select **Select all**.
- To deselect all of the options, select **Deselect all**.

The **High-Level Directory** entry field allows you to specify a drive and directory other than the default (C:\CICSCLI)



## CICS Client for Windows NT installation

7. To show how much disk space is available on each drive, select the **Disk space** push button. The Disk space panel is displayed.

The list box shows the amount of available disk space for each drive, and whether installation is possible. Select a drive from the list box if required. If you also select the **Change directories to selected drive** check box, when you return to the Install—directories panel, your selected drive is shown in the **High-Level Directory** field.

8. Select the **Install** push button to continue. An Installation progress panel is displayed. The panel shows:
  - The file currently being installed (source) and the drive and directory to which it is being installed (target)
  - A progress bar, indicating the number of files already unpacked and installed
  - The elapsed time
  - The status, for example, unpacking, processing, or transferring

If you select the **Stop** push button, you are asked whether you want to delete the partial system you have installed. Select **Yes** to delete the files already installed and return to the introductory CICS clients panel. Then, select **Start install** from the **File** menu to start the installation again.

9. If you have Administrator privileges, a panel is displayed asking you whether you want to install CICS Client for Windows NT as a common program group, or as a personal program group.

The panel also allows you to select:

- Whether the PATH environment variable is updated with the CICS Client for Windows NT path
  - Whether CICS Client for Windows NT is registered as a Windows NT service, see “Running CICS Client for Windows NT as a Windows NT service” on page 168.
10. A panel allowing you to select the language in which CICS clients messages are displayed is shown. Choose the required language and select **OK**.
  11. **Diskette installation only:** Insert the next installation diskette when you are prompted.
  12. When installation is complete, the Installation and Maintenance panel is displayed. Select **OK**, then **exit** from the introductory panel.
  13. When the installation process is complete, a Windows NT Program Manager group is created (see Figure 28 on page 168). In a fully installed system, the group window contains icons for:
    - The README.TXT file
    - Starting the client
    - Stopping the client
    - Showing the client status
    - Starting the terminal emulator

## CICS Client for Windows NT installation

- Starting the printer emulator
  - The installation and maintenance program
  - The CICS clients online documentation (optional)
14. Remove any diskette, shut down the system, and restart.

## Updating your CICS Client for Windows NT system

This section describes how you update your CICS Client for Windows NT system with new service levels. This is done using corrective service software, which allows you to service an installed CICS Client for Windows NT system with the latest level of software. You can install the corrective service software:

- Interactively, by running the installation and maintenance program from the icon in the CICS client group.
- Automatically, using a response file (see “Automatic installation of CICS Client for Windows NT” on page 58).

### The installation and maintenance program

When a CICS client is installed, the installation and maintenance program is installed along with the product software.

The icon for the installation and maintenance program is displayed in the CICS Client for Windows NT group. From this icon you can run the program to maintain all installed CICS Client for Windows NT systems. The installation and maintenance program allows you to:

- Install new CICS client systems, and additional CICS client components
- Update installed CICS client systems
- Restore backed up CICS client systems
- Delete installed CICS client systems

You can update from diskette or from a redirected LAN drive.

### The update process

The installation and maintenance program works with catalogs of products. A catalog contains a list of products; when you open a catalog, the installation and maintenance program lists the products that it contains. Before you update CICS Client for Windows NT, you must open the catalog for CICS Client for Windows NT and select the required product.

The process is as follows:

1. Click on the **Installation Utility** icon in the CICS Client for Windows NT group. The installation and maintenance program starts, and displays the main panel.
2. Select the **File** action, followed by the **Open catalog** option from the pulldown menu.
3. Now, select the **Drive** option. The Open drive catalog panel is displayed and this allows you to select the drive containing the corrective service software. When you select the drive, the catalog file (for example, CCLCLNT.ICF) is listed under

## CICS Client for Windows NT installation

**Filename.** Select the appropriate drive and open the catalog. The products in the catalog are listed.

4. Make sure that the correct service level of CICS client is selected in the list of products.

Make sure that you will have enough disk space for the product components you want to update, and any that you want to back up.

5. Select the **Update** action from the **Action** menu. The Update panel is displayed.
6. If you select the **Save a backup version** check box, the system being replaced by the application of the corrective service software is backed up. The backed up system can later be restored to the previous service level by selecting the **Restore** option from the **Action** menu. This gives you the chance to check that the updated system works correctly before you delete the old system.
7. Select the **Update** push button. The installation and maintenance program unpacks and copies the modules from the corrective service software to the installed system.

Updating an installed CICS client system causes the client initialization file, keyboard mapping file, and color mapping file, to be overwritten. Although these files are backed up, it is recommended that you keep your own customized versions of these files with different names to those supplied. You should then reference these customized files by environment variables see “Renaming the client initialization and mapping files” on page 139.

### Deleting a CICS Client for Windows NT system

Before deleting a CICS Client for Windows NT system, make sure that the client itself is not running. (If a file to be deleted is in use, the delete process stops.)

To delete a CICS Client for Windows NT system:

1. Use the Installation utility to open the catalog used to install the system. If you use the catalog you used for updating, only the files transferred from the corrective service software are deleted.
2. Select the **Delete** option from the **Actions** menu. The Delete panel is displayed.
3. Select the components you want to delete. To select or deselect all of the components, click on **Select** or **Deselect** respectively. If you want to delete only the backup versions, select the **Delete only the backup versions** check box.
4. Select the **Delete** push button. A progress panel is displayed, showing the proportion of files already deleted. You can select the **Stop** push button to stop the deletion.

**Attention:** When you mark components for deletion it is not possible to delete some files immediately, because they are in use. The files that cannot be deleted are removed by running the EPFIDEFI.BAT file, which is placed in the root directory of the drive containing the operating system.

## CICS Client for Windows NT installation

### Automatic installation of CICS Client for Windows NT

You can perform automatic installation and maintenance of CICS Client for Windows NT by supplying the required options in a **response file**. It is therefore possible to install CICS Client for Windows NT on workstations without user interaction being required at the workstation.

This kind of automatic installation is particularly useful for installing CICS Client for Windows NT over a network because installation can be performed from a redirected LAN drive. (Refer to the documentation for your network operating system if you need to know how to connect to network drives.)

To start the installation, call the installation program by entering `INSTALL` together with the required parameters. For example:

```
INSTALL /A:I /R:F:\INSTCICS\CICSCLI.RSP
/S:F:\INSTCICS
/L1:F:\INSTCICS\CICSCLI.OUT
/L2:F:\INSTCICS\CICSCLI.HIS /X
```

In this example, CICS Client for Windows NT is installed from the redirected drive F: on the server, according to the options supplied in the response file `CICSCLI.RSP`. The response file specifies the drive and directory in which to install CICS Client for Windows NT. Errors are logged in `CICSCLI.OUT` and the history log is contained in `CICSCLI.HIS`. The `/X` parameter specifies that the installation is noninteractive.

**Note:** The base level of CICS Client for Windows NT is installed using the `INSTALL` command, while corrective service software is installed using the `EPFINSTS` command.

The installation and maintenance parameters are described in “The installation and maintenance parameters” on page 240.

## CICS Client for Macintosh installation

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### Installing CICS Client for Macintosh

**Note:** If you are re-installing CICS Client for Macintosh, you may want to save any modified option files in a separate folder to protect them from being overwritten

To install CICS Client for Macintosh:

1. Insert the installation diskette and double-click on the disk icon. An installation folder containing several icons appears.
2. Double-click the Readme icon to browse through the README file for CICS Client for Macintosh if required.
3. Double-click on the Install icon to start the installation.
4. An introductory panel is displayed. Select **Continue** to continue with the installation.
5. A CICSInstall panel is displayed. Select the hard disk for the CICS Client.
6. If you want to install CICS Client for Macintosh into a folder other than the default CICSCLI folder, choose **Select Folder** and enter the folder name.
7. If you want to install all components of CICS Client for Macintosh, simply select **Install** to start the installation.
8. If you want to select only certain components for installation, select **Custom Install** from the pull-down. You then have the following menu choices:

- **CICS Client for Macintosh**

After you click on the arrow, you can select individual components of CICS Client for Macintosh

- **Language Selection**

After you click on the arrow, you must select the language in which CICS clients messages are displayed. It is important to select a language, otherwise CICS Client for Macintosh may not be installed properly.

When you have chosen the required options, return to the CICSInstall panel and select **Install**.

9. An installation progress panel is displayed while CICS Client for Macintosh is installing.

To exit from the installation process at any time, select **Quit**. Online help is available.

The installation process creates folders for CICS Client for Macintosh, (see "CICS Client for Macintosh" on page 65), and adds the CICS Client preferences file to the Preferences folder. The BIN folder contains icons as shown in Figure 29 on page 169. The installation process also adds the following to the Extensions folder:

CCLMAC.LIB  
CCLMACIP  
CCLMACSN

## Installing CICS Gateway for Java

Also, it may leave the following temporary files in the System folder:

- Install cleanup
- Install temp folder, containing:
  - CCLMAC.LIB
  - CCLMACIP
  - CCLMACSN

These objects are not part of the installation itself, and are deleted automatically the next time the system is restarted.

You can use the installation program to remove components of CICS Client for Macintosh. To do this, select the **Custom Remove** pull-down option from the CICSInstall panel. This only removes the CICS extensions. You can remove the CICS Client for Macintosh folder by dragging it to the Wastebasket.

## Updating your CICS Client for Macintosh system

To update your CICS clients system with new service levels, you use corrective service software. This allows you to service an installed CICS clients system with the latest level of software.

To install a corrective service software, proceed in the same way as for installing CICS Client for Macintosh. Remember to read the README file supplied with the corrective service software.

## Deleting your CICS Client for Macintosh system

To delete your CICS Client for Macintosh.

1. Remove the CICSCLI folder from the system
2. Remove CCLMACIP, CCLMACSN, and CCLMAC.LIB from the Extensions folder
3. Remove 'CICS Client Prefs' from the Preferences folder.

---

## Installing CICS Gateway for Java

The CICS Gateway for Java is provided as a component of CICS Client for OS/2 and CICS Client for Windows NT. The CICS Gateway for Java is supplied as a self-extracting .EXE file called JG-20OS2.EXE (OS/2), JG-20NT.EXE (Windows NT), and is the only file installed in the \CICSCLI\JAVA directory. When you run this file, it creates and populates a JGATE directory tree, so you may wish to copy the .EXE file to somewhere other than \CICSCLI\JAVA before running it. When you have run the self-expanding file, refer to the JGATE\README.TXT file and to the supplied HTML files for further instructions on using the CICS Gateway for Java.

## CICS clients directory structure

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### CICS clients directory structure

This section describes the directory structure (or in the case of CICS Client for Macintosh, the folder structure) of the CICS clients.

**Note:** The actual on-screen presentation of this structure may vary from that shown in the diagrams.

### CICS Client for DOS

The directory structure for CICS Client for DOS is as shown in Figure 11.

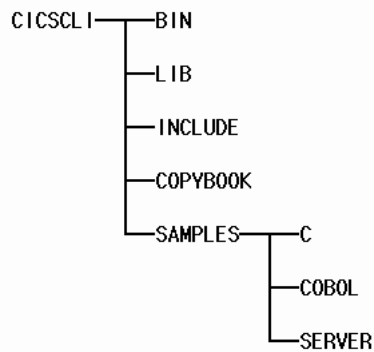


Figure 11. CICS Client for DOS directory structure

## CICS clients directory structure

### CICS Client for OS/2

The directory structure for CICS Client for OS/2 is as shown in Figure 12.

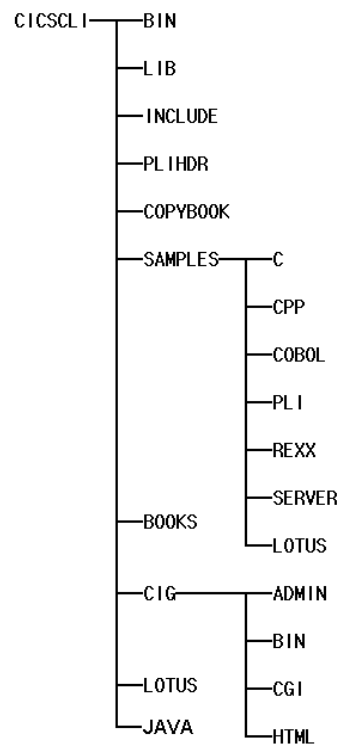


Figure 12. CICS Client for OS/2 directory structure



## CICS clients directory structure

### CICS Client for Windows

The directory structure for CICS Client for Windows is as shown in Figure 13.

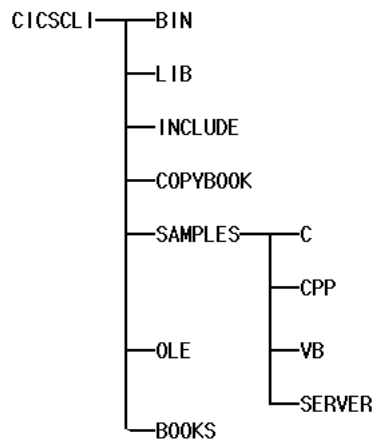


Figure 13. CICS Client for Windows directory structure

### CICS Client for Windows 95

The directory structure for CICS Client for Windows 95 is as shown in Figure 14.

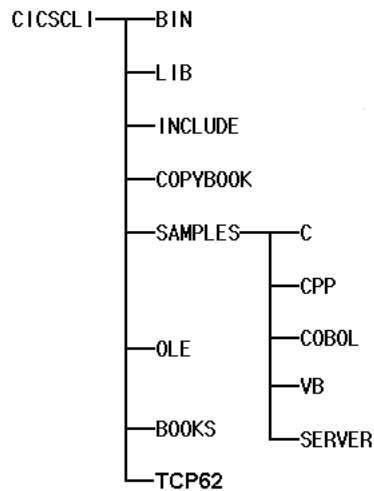


Figure 14. CICS Client for Windows 95 directory structure

## CICS clients directory structure

### CICS Client for Windows NT

The directory structure for CICS Client for Windows NT is as shown in Figure 15.

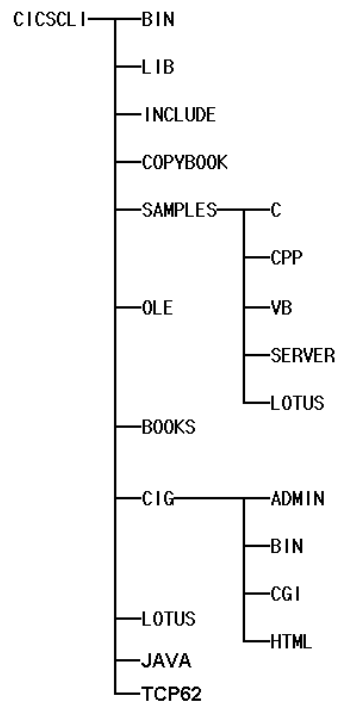


Figure 15. CICS Client for Windows NT directory structure

## CICS clients directory structure

### CICS Client for Macintosh

The folders for CICS Client for Macintosh are named to correspond to directory names for the other CICS clients, that is, **bin**, **headers**, **lib**, and **samples**.

### Contents of the CICS clients directories or folders

The directories or folders contain the following files:

<b>CICSCLI</b>	The default High-level directory name, selected during installation.
<b>BIN</b>	The .EXE, .DLL and .INI files for the CICS clients.
<b>LIB</b>	The supplied library files for linking user applications.
<b>INCLUDE</b>	Header files for C and C++ programs.
<b>HEADERS</b>	CICS Client for Macintosh only: Header files for C programs.
<b>PLIHDR</b>	Include files for PL/I programs. <b>Note:</b> CICS Client for OS/2 only.
<b>COPYBOOK</b>	Copybook files for COBOL programs.
<b>SAMPLES</b>	All product-supplied samples.
<b>C</b>	All supplied samples written in C.
<b>CPP</b>	All supplied samples written in C++ (all CICS clients except CICS Client for DOS and CICS Client for Macintosh)
<b>COBOL</b>	All supplied samples written in COBOL. <b>Note:</b> CICS Client for DOS, CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT only.
<b>PL/I</b>	All supplied samples written in PL/I. <b>Note:</b> CICS Client for OS/2 only.
<b>REXX</b>	All supplied samples written in REXX. <b>Note:</b> CICS Client for OS/2 only.
<b>LOTUS</b>	All samples for CICS gateway for Lotus Notes <b>Note:</b> CICS Client for OS/2 and CICS Client for Windows NT only.
<b>VB</b>	All samples written in Visual Basic <b>Note:</b> CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT only.
<b>SERVER</b>	Sample programs required for CICS servers.

## CICS clients directory structure

<b>OLE</b>	Files supporting Object Linking and Embedding (OLE) for Visual Basic <b>Note:</b> CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT only.
<b>BOOKS</b>	All manuals shipped with the product. <b>Note:</b> This does not apply to CICS Client for DOS
<b>CIG</b>	CICS Internet gateway files. <b>Note:</b> CICS Client for OS/2 and CICS Client for Windows NT only. <b>ADMIN</b> CICS Internet gateway files <b>BIN</b> CICS Internet gateway executable files. <b>CGI</b> Common Gateway Interface (CGI) files. <b>HTML</b> HyperText Markup Language (HTML) files.
<b>JAVA</b>	The self-expanding files for the CICS Gateway for Java. <b>Note:</b> CICS Client for OS/2 and CICS Client for Windows NT only.
<b>LOTUS</b>	CICS gateway for Lotus Notes files. <b>Note:</b> CICS Client for OS/2 and CICS Client for Windows NT only.
<b>TCP62</b>	TCP62 files. <b>Note:</b> CICS Client for Windows 95, and CICS Client for Windows NT only.

### Notes:

1. The SAMPLES directory or folder is created only if you install the CICS clients samples component.
2. The subdirectories or folders created under the SAMPLES directory depend on the languages supported for the CICS client installed.
3. The BOOKS directory or folder is created only if you install the CICS client documentation component.
4. The \LOTUS directories are created only if you install the CICS gateway for Lotus Notes components of CICS Client for OS/2 or CICS Client for Windows NT.
5. The \CIG directories are created only if you install the CICS Internet gateway component of CICS Client for OS/2 and CICS Client for Windows NT.

## Other actions required in setting up a client

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### Other actions required in setting up a CICS client

This section describes what you can do after the client software has been installed, and before you edit the client initialization file and start the client.

#### CICS Client for DOS

Before you can start CICS Client for DOS, you must run CICSCTSR, the terminate and stay resident (TSR) program. The supplied program CICSDOESC.BAT runs CICSCTSR (which starts the client DOS support service) and then starts CICS Client for DOS automatically.

You may, therefore, want to add the following to your AUTOEXEC.BAT file:

```
CALL CICSDOESC
```

#### Reducing memory requirements for CICS Client for DOS

You may need to review and reduce the memory requirements of CICS Client for DOS.

The CICS Client for DOS TSR program is in two pieces: CICSCTSR.EXE, which is loaded once and stays resident, and CCLCLNT.EXE, which may be loaded and unloaded using the CICSCLI command. CICSCTSR.EXE requires approximately 4 KB of memory, while CCLCLNT.EXE requires approximately 79 KB of memory.

Additional memory is then required according to the contents of the client initialization file. The DOS memory pool must be allocated and the size of this is controlled by the DosMemory parameter in the Client section of the client initialization file, the default being 48 KB. Each device driver listed in a Driver section must also be loaded. The approximate memory requirements of these are:

<b>CCLIBMNB.DLL</b>	14 KB
<b>CCLIBMIP.DLL</b>	48 KB
<b>CCLFTPIP.DLL</b>	49 KB
<b>CCLNOVIP.DLL</b>	44 KB
<b>CCLNOVSN.DLL</b>	20 KB
<b>CCL400SN.DLL</b>	6 KB

The client and any loaded drivers allocate any additional memory they require from the client's DOS memory pool. These requirements vary but are typically based on the MaxServers and MaxBufferSize parameters in the Client section of the client initialization file.

**Note:** If you are using the trace to memory function, you must increase the DosMemory value.

Therefore, to reduce memory requirements to a minimum, edit the following in the client initialization file:

1. Remove all unwanted Driver sections from the initialization file.
2. Reduce the MaxServers parameter to a minimum (the minimum value is 1).
3. Reduce the MaxBufferSize parameter to a minimum (the minimum value is 4).

## Other actions required in setting up a client

4. Reduce the DosMemory parameter to a minimum (the minimum value is MaxBufferSize + 4). However, more may be required if the message CCL2007E Free memory is exhausted is displayed.

For more information on the client initialization file, refer to "Preparing the client initialization file" on page 140.

### CICS Client for OS/2

If you want the CICS terminal emulation to be started automatically when OS/2 starts up, create a shadow of the CICS Terminal icon and place it in the OS/2 startup folder.

### CICS Client for Windows

If you want the CICS terminal emulation to be started automatically when Windows starts up, move or copy the CICS Terminal icon to the Startup group.

#### WIN-OS2 considerations

For Windows clients running under OS/2 Version 2.0, you should select **Win-OS2 Window** in the Settings notebook for the terminal and control panel icons. Do not set them to separate sessions (that is, do not select the **Separate sessions** check box in the Settings notebook).

It is useful to have the Windows Program Manager running in a separate session to that used by the client. This ensures that when the Program Manager is closed, the client session is not closed as well.

### CICS Client for Windows 95

If you want the CICS terminal emulation to be started automatically when Windows 95 starts up, move or copy the CICS Terminal icon to the Startup folder.

### CICS Client for Windows NT

If you want the CICS terminal emulation to be started automatically when Windows NT starts up, move or copy the CICS Terminal icon to the Startup group.

### CICS Client for Macintosh

To start CICS Client for Macintosh automatically when you switch on or restart your Apple Macintosh, create an alias of the **CICS Client** from the bin folder and place it in your Startup Items folder in the System folder. If started this way, the client picks up the initialization file name from the **CICS Client Prefs** file in your Preferences folder. You can change the initialization file name held in the **CICS Client Prefs** file via the **File** menu of the CICS Client Admin (CICSCLI) application.

## Setting up client/server communication

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### Chapter 4. Setting up client/server communication

This chapter describes the following:

- “NetBIOS configuration” on page 72
- “TCP/IP configuration” on page 76
- “APPC configuration” on page 94  
(Each of these sections contains a sub-section for each CICS client)
- “CICS clients in Novell NetWare LANs” on page 126  
This describes how CICS clients can communicate over NetBIOS in a Novell NetWare LAN.

This chapter discusses how to set up the communication links between CICS clients and the CICS servers.

The NetBIOS, TCP/IP, or APPC protocols can be used to enable clients and servers to communicate. See Chapter 2, “Planning before installation” on page 9 for details of what levels of the various protocols are required.

This chapter summarizes the products and definitions that are required on CICS servers. Full details of setting up a CICS server for communication are given in the individual CICS server books, see “CICS publications” on page xix.

After the client has been installed, and the server has been set up for communication, the following steps are necessary:

- Enable and set up NetBIOS, TCP/IP, or APPC communication
- Edit the client configuration file (see “Preparing the client initialization file” on page 140)

## Setting up client/server communication

### Client/server definitions

This chapter includes definition checklists for each CICS client. Definition checklists show the definitions required to allow client/server communication using a particular product and protocol:

- Definitions required for communication products at the CICS server.
- Definitions required on the CICS server.
- Definitions required for the communication product at the CICS client.
- Definitions required in the client initialization file
- Example values for the definitions.

As far as possible, the example values are based on the values in the supplied client initialization file, CICSCLI.INI. See “Preparing the client initialization file” on page 140 for more information.

- The definitions that must match.

The following is a simple example of a set of definition checklists. It shows the definitions required to connect a CICS Client for OS/2 to a CICS for OS/2 server. **The example values are samples only—you must enter your own values.** However, in the checklists in this chapter, the values shown for DriverName in the client initialization file are the actual driver names that you must use.

#### CICS server definitions

CICS for OS/2 System Initialization Table Definitions	Ref. Key	Example
Local System Appl ID	<b>1</b>	CICSOS2
NetBIOS Listener Adapter	<b>2</b>	0
Maximum NetBIOS Systems		15

#### CICS client definitions

Client Initialization File Definitions	Ref. Key	Example
Server		CICSNETB
Protocol		NETBIOS
Netname	<b>1</b>	CICSOS2
Adapter	<b>2</b>	0
Driver		NETBIOS
DriverName		CCLIBMNB

Ref. Key	CICS for OS/2	Client Initialization File	Example
<b>1</b>	Local System Appl ID	Netname	CICSOS2
<b>2</b>	NETBIOS Listener Adapter	Adapter	0



## Setting up client/server communication

In the above tables the definitions that must match are indicated by reference keys, **1**, **2**, and so on. ***Definitions with the same reference key must match.***

This book does not give details for every possible client/server configuration. Typical examples are given representing the most likely configurations. More example configurations are described in the *CICS Clients Unmasked* book.

## NetBIOS configuration

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### NetBIOS configuration

This section describes how to set up CICS clients for communication via the NetBIOS protocol.

All communication between a client and server is multiplexed on one NetBIOS session.

### CICS Client for DOS

For CICS Client for DOS, NetBIOS can be provided by the IBM LAN Support Program Version 1.3. For information on installing this program, see the *Local Area Network Support Program Version 1.3 User's Guide*, and the associated READ.ME file on the installation diskette.

CICS Client for DOS can also run in a Virtual DOS Machine (VDM) under OS/2 (a so-called "DOS box") and utilize the NetBIOS Virtual Device Driver (VDD) support offered by OS/2. VDD support is initialized by running SETUPVDD.EXE from the \IBMCOM directory in an OS/2 session, which writes the following lines to CONFIG.SYS:

```
DEVICE=C:\IBMCOM\PROTOCOL\LANPDD.OS2  
DEVICE=C:\IBMCOM\PROTOCOL\LANVDD.OS2
```

When you restart the system, NetBIOS support is ready for use from a VDM. A DOS client from a VDM can run against a CICS for OS/2 server in the same workstation.

### Definition checklists

The following shows example definitions for connecting CICS Client for DOS to a CICS for OS/2 server (these are also applicable to CICS for Windows NT Version 2):

#### *CICS server definitions*

CICS for OS/2 System Initialization Table Definitions	Ref. Key	Example
Local System Appl ID	<b>1</b>	CICSOS2
NetBIOS Listener Adapter	<b>2</b>	0
Maximum NetBIOS Systems		15

#### *CICS client definitions*

Client Initialization File Definitions	Ref. Key	Example
Server		CICSNETB
Protocol		NETBIOS
Netname	<b>1</b>	CICSOS2
Adapter	<b>2</b>	0
Driver		NETBIOS
DriverName		CCLIBMNB

## NetBIOS configuration

*Table 10. Matching definitions: CICS Client for DOS to CICS for OS/2 using NetBIOS*

Ref. Key	CICS for OS/2	Client Initialization File	Example
<b>1</b>	Local System Appl ID	Netname	CICSOS2
<b>2</b>	NETBIOS Listener Adapter	Adapter	0

### CICS Client for OS/2

For CICS Client for OS/2, NetBIOS is provided by, for example, Network Transport Services/2. (See "CICS Client for OS/2 software requirements" on page 27 for a list of products that provide NetBIOS.)

#### Definition checklists

For connecting CICS Client for OS/2 to a CICS for OS/2 (or CICS for Windows NT Version 2) server, the definitions are the same as for CICS Client for DOS.

## NetBIOS configuration

### CICS Client for Windows

For CICS Client for Windows, NetBIOS can be provided by the IBM LAN Support Program Version 1.3. For information on installing this program, see the *Local Area Network Support Program Version 1.3 User's Guide*, and the associated READ.ME file on the installation diskette.

#### Definition checklists

For connecting CICS Client for Windows to a CICS for OS/2 (or CICS for Windows NT Version 2) server, the definitions are the same as for CICS Client for DOS.

### CICS Client for Windows 95

NetBIOS support is provided with Windows 95, and no further configuration is required after installation.

#### Definition checklists

For connecting CICS Client for Windows 95 to a CICS for OS/2 (or CICS for Windows NT Version 2) server, the definitions are the same as for CICS Client for DOS.

### CICS Client for Windows NT

NetBIOS support is provided with Windows NT, because NETBEUI (NetBIOS extended user interface) is automatically installed during Windows NT setup. However, via the Network Settings panel, you must configure the NetBIOS Interface with settings like the following example, which is for an IBM Auto 16/4 Token Ring ISA adapter:

<b>Network Route</b>	0: Nbf->IbmTok4->IbmTok41
<b>Lana Number</b>	0. This matches the Adapter parameter in the client initialization file.

#### Definition checklists

For connecting CICS Client for Windows NT to a CICS for OS/2 (or CICS for Windows NT Version 2) server, the definitions are the same as for CICS Client for DOS.

## NetBIOS resources

CICS Clients have a NetBIOS resource requirement that is in addition to products such as LAN Server and DB2/2.

The CICS client requirement for NetBIOS resources is affected by the MaxServers parameter in the client initialization file. The resource requirements must therefore be increased as follows:

<b>NetBIOS Names</b>	1
<b>NetBIOS Commands</b>	Value of MaxServers + 1
<b>NetBIOS Sessions</b>	Value of MaxServers.

## NetBIOS configuration

For CICS Client for OS/2, the NetBIOS resource requirements are coded in the \IBMCOM\PROTOCOL.INI file. PROTOCOL.INI is the LAN adapter and protocol support (LAPS) configuration file.

For information on how to code NetBIOS resource requirements for other CICS clients, refer to the documentation for the NetBIOS-providing product.

“CICS clients in Novell NetWare LANs” on page 126 describes how CICS clients can communicate over NetBIOS in a Novell NetWare LAN.

## TCP/IP configuration

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### TCP/IP configuration

This section describes how to set up CICS clients for communication via the TCP/IP protocol. To configure TCP/IP for communication with CICS servers, you need to know the following:

- The IP address/host name of the CICS clients
- The IP address/host name of the CICS servers
- The IP address/name of any domain nameserver
- The subnet mask (if required)
- The port number of the CICS servers

If you are using a domain nameserver you can specify symbolic hostnames rather than IP addresses. Hostnames are easier to remember, and can be made meaningful.

Your system administrator can supply this information, which is also used in preparing the client initialization file.

**Note:** In the \ETC\SERVICES file, you can enter CICS in either uppercase or lowercase.

### CICS Client for DOS

The following sections summarize TCP/IP configuration for CICS Client for DOS.

#### IBM TCP/IP for DOS

For information on installing and configuring IBM TCP/IP for DOS, see the *IBM TCP/IP Version 2.1.1 for DOS Installation and Maintenance* book.

**Note:** If you are running CICS Client for DOS in the DOS box of OS/2, you must have the DOS/Windows Access Kit for TCP/IP Version 2.0. (This is also supplied with Warp Connect and Warp Server.)

You can use the TCPCHECK program to verify the installation. TCPCHECK verifies the configuration parameters, and sends a TCP/IP PING command to check the route to all defined servers.

## TCP/IP configuration

### Definition checklists

The following shows example definitions for connecting CICS Client for DOS to a CICS for AIX server:

#### *CICS server definitions*

TCP/IP for AIX/6000 Definitions	Ref. Key	Example
HOSTNAME	<b>1</b>	cicstcp.ibm.com
Internet ADDRESS	<b>2</b>	192.113.36.200
Network MASK	<b>3</b>	255.255.255.0
NAMESERVER Internet ADDRESS	<b>4</b>	192.113.36.250
DOMAIN Name	<b>5</b>	acme.ibm.com
TCP/IP service name	<b>6</b>	cicstcp
Port number	<b>7</b>	0
Protocol type (TCP only)		TCP

CICS for AIX Server Definitions	Ref. Key	Example
Listener Identifier		anyname
Protocol type (TCP only)		TCP
TCP adapter address	<b>2</b>	192.113.36.200
TCP service name	<b>6</b>	cicstcp

#### *CICS Client Definitions*

TCP/IP for DOS Definitions	Ref. Key	Example
Host name		myhost
IP Address		192.113.36.78
Subnet Mask	<b>3</b>	255.255.255.0
Domain name server address (DNSA)	<b>4</b>	192.113.36.250
Domain name	<b>5</b>	acme.ibm.com

Client Initialization File	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname (host name)	<b>1</b>	cicstcp.ibm.com
Netname (IP address)	<b>2</b>	192.113.36.200
Port	<b>7</b>	0
Driver		TCPIP
DriverName		CCLIBMIP

## TCP/IP configuration

*Table 11. Matching definitions: CICS Client for DOS to CICS for AIX using TCP/IP for DOS*

Ref. Key	TCP/IP for AIX/6000	CICS for AIX	TCP/IP for DOS	Client Initialization File	Example
<b>1</b>	HOSTNAME			Netname (host name)	cicstcp.ibm.com
<b>2</b>	Internet ADDRESS	TCP adapter address		Netname (IP address)	192.113.36.200
<b>3</b>	Network MASK		Subnet Mask		255.255.255.0
<b>4</b>	NAMESERVER Internet ADDRESS		DNSA		192.113.36.250
<b>5</b>	DOMAIN Name		Domain name		acme.ibm.com
<b>6</b>	TCP/IP service name	TCP service name			cicstcp
<b>7</b>	Port number			Port	0



## TCP/IP configuration

### TCP/IP from FTP Inc

For information on installing and configuring PC/TCP Network Software, see the *PC/TCP Network Software Installation Guide*.

### Definition checklists

The following shows example definitions for connecting CICS Client for DOS to a Transaction Server for Windows NT server:

#### CICS server definitions

TCP/IP for Windows NT Definitions	Ref. Key	Example
Host Name	<b>1</b>	cicstcp
IP Address	<b>2</b>	192.113.36.200
Subnet Mask	<b>3</b>	255.255.255.0
Domain Name Server	<b>4</b>	192.113.36.250
Domain Name	<b>5</b>	acme.ibm.com

CICS for Windows NT Listener Definitions	Ref. Key	Example
Listener name		ANYNAME
Protocol		TCP
<b>Note:</b> You can leave other listener definitions as the default values. See <i>Transaction Server for Windows NT Administration Reference</i> for more information.		

#### CICS client definitions

PC/TCP for DOS/Windows Definitions	Ref. Key	Example
Hostname		myhost
IP Address		192.113.36.78
Router		192.113.36.25
Subnet Mask	<b>3</b>	255.255.255.0
DNS Server Address	<b>4</b>	192.113.36.250
Domain Name	<b>5</b>	acme.ibm.com

Client Initialization File Definitions	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname (host name)	<b>1</b>	cicstcp
Netname (IP address)	<b>2</b>	192.113.36.200
Port		0
Driver		TCPIP
DriverName		CCLFTPIP

## TCP/IP configuration

*Table 12. Matching definitions: CICS Client for DOS to CICS for Windows NT using PC/TCP*

Ref. Key	TCP/IP for Windows NT	PC/TCP for DOS/Windows	Client Initialization File	Example
<b>1</b>	Host Name		Netname (host name)	cicstcp.ibm.com
<b>2</b>	IP Address		Netname (IP address)	192.113.36.200
<b>3</b>	Subnet Mask	Subnet Mask		255.255.255.0
<b>4</b>	Domain Name Server	DNS Server Address		192.113.36.250
<b>5</b>	Domain Name	Domain Name		acme.ibm.com

## TCP/IP configuration

### Novell LAN Workplace for DOS

For information on installing and configuring Novell LAN Workplace for DOS, see the *Novell LAN Workplace Installation Guide*.

### Definition checklists

The following shows example definitions for connecting CICS Client for DOS to a Transaction Server for Windows NT server:

#### *CICS server definitions*

TCP/IP for Windows NT Definitions	Ref. Key	Example
Host Name	<b>1</b>	cicstcp
IP Address	<b>2</b>	192.113.36.200
Subnet Mask	<b>3</b>	255.255.255.0
Domain Name Server	<b>4</b>	192.113.36.250
Domain Name	<b>5</b>	acme.ibm.com

CICS for Windows NT Listener Definitions	Ref. Key	Example
Listener name		ANYNAME
Protocol		TCP
<b>Note:</b> You can leave other listener definitions as the default values. See <i>Transaction Server for Windows NT Administration Reference</i> for more information.		

#### *CICS client definitions*

LAN Workplace Definitions	Ref. Key	Example
Hostname		myhost
IP Address		192.113.36.78
Router		192.113.36.25
Subnet Mask	<b>3</b>	255.255.255.0
DNS Server Address	<b>4</b>	192.113.36.250
Domain Name	<b>5</b>	acme.ibm.com

Client Initialization File Definitions	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname (host name)	<b>1</b>	cicstcp
Netname (IP address)	<b>2</b>	192.113.36.200
Port		0
Driver		TCPIP
DriverName		CCLNOVIP

## TCP/IP configuration

*Table 13. Matching definitions: CICS Client for DOS to CICS for Windows NT using LAN Workplace*

Ref. Key	TCP/IP for Windows NT	LAN Workplace	Client Initialization File	Example
<b>1</b>	Host Name		Netname (host name)	cicstcp.ibm.com
<b>2</b>	IP Address		Netname (IP address)	192.113.36.200
<b>3</b>	Subnet Mask	Subnet Mask		255.255.255.0
<b>4</b>	Domain Name Server	DNS Server Address		192.113.36.250
<b>5</b>	Domain Name	Domain Name		acme.ibm.com

## TCP/IP configuration

### CICS Client for OS/2

The following sections summarize TCP/IP configuration for CICS Client for OS/2.

#### IBM TCP/IP for OS/2

For information on installing and configuring IBM TCP/IP for OS/2, see, for example, the *IBM TCP/IP Version 2.0 for OS/2 Installation and Maintenance* book.

#### Definition checklists

The following shows example definitions for connecting CICS Client for OS/2 to a CICS for OS/2 server:

##### *CICS server definitions*

TCP/IP for OS/2 Definitions	Ref. Key	Example
IP address of workstation	<b>1</b>	9.113.36.31
IP address of Domain Name Server	<b>4</b>	9.113.42.240
IP address of router		9.113.36.254
Subnet Mask		255.255.254.0
Hostname	<b>2</b>	cicstcp.ibm.com
Port number	<b>3</b>	0

CICS for OS/2 System Initialization Table Definitions	Ref. Key	Example
TCP/IP Local Host Name	<b>1</b> or <b>2</b>	*
TCP/IP Local Host Port	<b>3</b>	*
Maximum TCP/IP Systems		15
<b>Note:</b> You can enter values for the TCP/IP Local Host Name and TCP/IP Local Host Port, or use the default values of *. See <i>CICS for OS/2 Customization</i> for more information.		

##### *CICS client definitions*

TCP/IP for OS/2 Definitions	Ref. Key	Example
IP address of workstation		9.113.36.25
IP address of Domain Name Server	<b>4</b>	9.113.42.240
Subnet Mask		255.255.254.0
IP address of router		9.113.36.254

Client Initialization File Definitions	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname	<b>1</b> or <b>2</b>	cicstcp.ibm.com
Port	<b>3</b>	0
Driver		TCPIP
DriverName		CCLIBMIP

## TCP/IP configuration

*Table 14. Matching definitions: CICS Client for OS/2 to CICS for OS/2 using TCP/IP for OS/2*

Ref. Key	TCP/IP on Server	CICS for OS/2 on Server	TCP/IP on Client	Client Initialization File	Example
<b>1</b>	IP address	TCP/IP Local Host Name		Netname	9.113.36.31
<b>2</b>	Hostname	TCP/IP Local Host Name		Netname	cicstcp.ibm.com
<b>3</b>	Port number	TCP/IP Local Host Port		Port	0
<b>4</b>	IP address of Domain Name Server		IP address of Domain Name Server		9.113.42.240

## TCP/IP configuration

The following shows example definitions for connecting CICS Client for OS/2 to a CICS for AIX server:

### *CICS server definitions*

TCP/IP for AIX/6000 Definitions	Ref. Key	Example
HOSTNAME	<b>1</b>	cicstcp.ibm.com
Internet ADDRESS	<b>2</b>	192.113.36.200
Network MASK	<b>3</b>	255.255.255.0
Client Hostname	<b>4</b>	myhost
Client Address	<b>5</b>	192.113.36.78
TCP/IP service name	<b>6</b>	cicstcp
Port number	<b>7</b>	0
Protocol type (TCP only)		TCP

CICS for AIX Server Definitions	Ref. Key	Example
Listener Identifier		anyname
Protocol type (TCP only)		TCP
TCP adapter address	<b>2</b>	192.113.36.200
TCP service name	<b>6</b>	cicstcp

### *CICS client definitions*

TCP/IP for OS/2 Definitions	Ref. Key	Example
Host name	<b>4</b>	myhost
IP Address	<b>5</b>	192.113.36.78
Subnet Mask	<b>3</b>	255.255.255.0
Server IP Address	<b>2</b>	192.113.36.200
Server HostName	<b>1</b>	cicstcp.ibm.com

Client Initialization File	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname (host name)	<b>1</b>	cicstcp.ibm.com
Netname (IP address)	<b>2</b>	192.113.36.200
Port	<b>7</b>	0
Driver		TCPIP
DriverName		CCLIBMIP

## TCP/IP configuration

*Table 15. Matching definitions: CICS Client for OS/2 to CICS for AIX using TCP/IP for OS/2*

Ref. Key	TCP/IP for AIX/6000	CICS for AIX	TCP/IP for OS/2	Client Initialization File	Example
<b>1</b>	HOSTNAME		Server Hostname	Netname (host name)	cicstcp.ibm.com
<b>2</b>	Internet ADDRESS	TCP adapter address	Server IP Address	Netname (IP address)	192.113.36.200
<b>3</b>	Network MASK		Subnet Mask		255.255.255.0
<b>4</b>	Client Hostname		Hostname		myhost
<b>5</b>	Client Address		IP Address		192.113.36.78
<b>6</b>	TCP/IP service name	TCP service name			cicstcp
<b>7</b>	Port number			Port	0

### TCP/IP from FTP Inc

For information on installing and configuring PC/TCP Network Software, see the *PC/TCP Network Software Installation Guide*.

### Definition checklists

For connecting CICS Client for OS/2 to a CICS for Windows NT server, the definitions are the same as for CICS Client for DOS.

### Novell LAN Workplace for OS/2

For information on installing and configuring Novell LAN Workplace for OS/2, see the *Novell LAN Workplace Installation Guide*.

### Definition checklists

The definitions are the same as for CICS Client for DOS.

For connecting CICS Client for OS/2 to a CICS for Windows NT server, the definitions are the same as for CICS Client for DOS.



## TCP/IP configuration

### CICS Client for Windows

The following sections summarize TCP/IP configuration for CICS Client for Windows.

#### IBM TCP/IP for DOS

For information on installing and configuring IBM TCP/IP for DOS, see the *IBM TCP/IP Version 2.1.1 for DOS Installation and Maintenance* book.

**Note:** If you are running CICS Client for Windows in the WIN-OS2 subsystem of OS/2, you must have the DOS/Windows Access Kit for TCP/IP Version 2.0. (This is also supplied with Warp Server and Warp Connect.)

You can use the TCPCHECK program to verify the installation. TCPCHECK verifies the configuration parameters, and sends a TCP/IP PING command to check the route to all defined servers.

#### Definition checklists

For connecting CICS Client for Windows to a CICS for AIX server, the definitions are the same as for CICS Client for DOS. However, the DriverName parameter in the client initialization file must be set to CCLWINIP.

#### TCP/IP from FTP Inc

For information on installing and configuring PC/TCP Network Software, see the *PC/TCP Network Software Installation Guide*.

#### Definition checklists

For connecting CICS Client for Windows to a CICS for Windows NT server, the definitions are the same as for CICS Client for DOS. However, the DriverName parameter in the client initialization file must be set to CCLWINIP.

#### Novell LAN Workplace for DOS

For information on installing and configuring Novell LAN Workplace for DOS, see the *Novell LAN Workplace Installation Guide*.

#### Definition checklists

For connecting CICS Client for Windows to a CICS for Windows NT server, the definitions are the same as for CICS Client for DOS. However, the DriverName parameter in the client initialization file must be set to CCLWINIP.

#### Other TCP/IP products conforming to WINSOCK

TCP/IP can be provided by any other product conforming to the WINSOCK API. For information on installing such products, see the associated documentation.

Note that the DriverName parameter in the client initialization file must be set to CCLWINIP.

## TCP/IP configuration

### CICS Client for Windows 95

TCP/IP support is provided by the Windows 95 operating system. Refer to the Windows 95 documentation for information on configuring TCP/IP.

TCP/IP can also be provided by any other product conforming to the WINSOCK API. For information on installing such products, see the associated documentation.

#### Definition checklists

For connecting CICS Client for Windows 95 to a CICS for AIX server, or CICS for Windows NT server, the definitions are the same as for CICS Client for DOS. However, the DriverName parameter in the client initialization file must be set to CCLWNTIP.

### CICS Client for Windows NT

TCP/IP support is provided by the Windows NT operating system. Refer to the Windows NT documentation for information on configuring TCP/IP.

#### Definition checklists

For connecting CICS Client for Windows NT to a CICS for AIX server, or CICS for Windows NT server, the definitions are the same as for CICS Client for DOS. However, the DriverName parameter in the client initialization file must be set to CCLWNTIP.

## TCP/IP configuration

### CICS Client for Macintosh

For information on installing MacTCP, see the documentation supplied with your MacTCP package.

### Definition checklists

The following shows example definitions for connecting CICS Client for Macintosh to a CICS for OS/2 server:

#### *CICS server definitions*

TCP/IP for OS/2 Definitions	Ref. Key	Example
IP address of workstation	<b>1</b>	9.113.36.31
IP address of Domain Name Server	<b>4</b>	9.113.42.240
IP address of router		9.113.36.254
Subnet Mask		255.255.254.0
Hostname	<b>2</b>	cicstcp.ibm.com
Port number	<b>3</b>	0

CICS for OS/2 System Initialization Table Definitions	Ref. Key	Example
TCP/IP Local Host Name	<b>1</b> or <b>2</b>	*
TCP/IP Local Host Port	<b>3</b>	*
Maximum TCP/IP Systems		15
<b>Note:</b> You can enter values for the TCP/IP Local Host Name and TCP/IP Local Host Port, or use the default values of *. See <i>CICS for OS/2 Customization</i> for more information.		

#### *CICS client definitions*

MacTCP Definitions	Ref. Key	Example
IP address of workstation		9.113.36.25
IP address of Domain Name Server	<b>4</b>	9.113.42.240
Subnet Mask		255.255.254.0
IP address of router		9.113.36.254

Client Initialization File Definitions	Ref. Key	Example
Server		CICSTCP
Protocol		TCPIP
Netname	<b>1</b> or <b>2</b>	cicstcp.ibm.com
Port	<b>3</b>	0
Driver		TCPIP
DriverName		CCLMACIP

## TCP/IP configuration

*Table 16. Matching definitions: CICS Client for Macintosh to CICS for OS/2 using MacTCP*

Ref. Key	TCP/IP on Server	CICS for OS/2 on Server	MacTCP on Client	Client Initialization File	Example
<b>1</b>	IP address	TCP/IP Local Host Name		Netname	9.113.36.31
<b>2</b>	Hostname	TCP/IP Local Host Name		Netname	cicstcp.ibm.com
<b>3</b>	Port number	TCP/IP Local Host Port		Port	0
<b>4</b>	IP address of Domain Name Server		IP address of Domain Name Server		9.113.42.240

### Verifying the TCP/IP installation

To verify that CICS clients can communicate with CICS servers, you can use the TCP/IP PING command to check the route to the CICS server:

```
PING [machine address | name]
```

Therefore, to start PING, enter a command like the following:

```
PING 9.113.36.31
```

where 9.113.36.31 is an example of an IP address of the CICS server. If you are using a Domain Name Server, you can specify the symbolic hostname rather than the IP address of the server.

To stop the PING command, press the Ctrl+C keys simultaneously.

If you have installed TCP/IP correctly, you see messages as shown in the following figure:

```
# ping 9.113.36.31 56 3
PING 9.113.36.31: (9.113.36.31): 56 data bytes
64 bytes from 9.113.36.31: icmp_seq=0 ttl=255 time=3 ms
64 bytes from 9.113.36.31: icmp_seq=1 ttl=255 time=3 ms
64 bytes from 9.113.36.31: icmp_seq=2 ttl=255 time=3 ms

---9.113.36.31 PING Statistics---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 3/3/3 ms
#
```

*Figure 16. Example messages returned by PING command*

If the statistic messages show a value other than 0% packet loss, it is likely that you did not install or customize TCP/IP correctly. Therefore:

- Check for TCP/IP definition errors
- Check for TCP/IP definition mismatches

## TCP62 configuration

- Check the network physical connection

Depending on the platform, the implementation of the PING command might be slightly different, regarding the operation of the utility (icon or command) and the parameters that can be used. For more information, refer to the documentation associated with your TCP/IP product.

---

### TCP62 configuration

The TCP62 support of CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT allows communication with CICS for MVS/ESA Version 3.3 and later over a TCP/IP network.

On CICS for MVS/ESA you can use autoinstall to define APPC connections to clients dynamically, on their first use. On CICS for MVS/ESA Version 4.1 and CICS Transaction Server for OS/390, you can autoinstall parallel-session APPC connections. On CICS for MVS/ESA Version 3.3, you must use the resource definition commands to define connections to clients statically.

CICS client TCP62 communication only supports parallel-session APPC connections, not single-session connections.

APPC links to CICS clients support data synchronization levels (sync levels) 0 and 1.

Enabling CICS for MVS/ESA to communicate with a CICS client using TCP/IP requires actions on OS/390, CICS, VTAM, and the client workstation as follows. The following sections summarize these actions, for more information refer to the *CICS Family: Communicating from CICS on System/390* book.

### On OS/390

Any of the VTAM AnyNet releases must be installed. AnyNet originated as the Multi-Protocol Transport Feature (MPTF) with VTAM Version 3 Release 4.2 and this feature included support for APPC over TCP/IP. With VTAM Version 4 Release 2, it was retitled "VTAM V4 R2 AnyNet Feature". Similarly with VTAM Version 4 Release 3, AnyNet was available as the "VTAM V4 R3 AnyNet Feature". These features all require MVS/ESA SP Version 3 Release 1.3 or later and TCP/IP Version 2 Release 2.1 or later. MPTF V3 R4.2 and "AnyNet V4 R2" also require C/370 Version 2, but AnyNet V4 R3 requires Language Environment for MVS.

With VTAM Version 4 Release 4, which is also shipped as part of OS/390 Release 3, AnyNet has been integrated with VTAM and is no longer a separate feature. VTAM Version 4 Release 4 requires MVS/ESA SP Version 4 Release 3, LE Version 1 Release 3 and TCP/IP Version 3 Release 1.

On OS/390, you must:

1. Install a TCP major node, which defines the AnyNet interface between TCP/IP and VTAM. For further information about how to do this, see the *Guide to SNA over TCP/IP* book, SC31-6527.

## TCP62 configuration

2. Install a CDRSC major node, which defines the remote Client device and instructs VTAM to route any session requests through the TCP/IP Physical Unit (ALSLIST).
3. Check that the Physical Unit (PU) for the AnyNet interface is active.

### On CICS and VTAM

On CICS, you must:

1. Define an APPC connection to the client workstation. (The connection can be statically defined, or autoinstalled.)
  - On the MODENAME option of the SESSIONS definition, specify the same modename as that specified in the client initialization file. (The default modename in the client initialization file is TCP62.)
  - On the MAXIMUM option of the SESSIONS definition, specify the second value as one, that is, that CICS for MVS/ESA is to have one contention winner. For example, MAXIMUM(8,1) means that the modeset is to support eight sessions, and that CICS for MVS/ESA has one contention winner.
2. Add an entry to the VTAM logon mode (LOGMODE) table for the modename specified on the SESSIONS definition. This entry specifies the class of service required for the group of sessions.

### On the client workstation

On the client workstation, you must install and configure TCP/IP and ensure that the MVS system name is added to the TCP/IP HOSTS file. For **CICS Client for Windows NT and CICS Client for Windows 95**, you must install TCP62 support as provided by Personal Communications (see the following section), and configure the client initialization file see "Preparing the client initialization file" on page 140. You configure the client initialization file for CICS Client for OS/2, CICS Client for Windows NT, and CICS Client for Windows 95 in the same way. The driver is CCLTCP62.DLL

For **CICS Client for OS/2**, you must install TCP62 support as provided by Communications Server for OS/2 Version 5.0. Use a default AnyNet response file so that the AnyNet and TCP62 support is installed. (Sample response files are supplied on the Communications Server CD-ROM.)

If Communications Server (Kernel and SNA subsystem components) is stopped and you start a TCP62 client connection, Communications Server is then automatically started with a new response file, together with the TCP62 definitions in the client initialization file. Any TCP62 definitions in the default response file are overwritten by those supplied in the client initialization file in this case.

If Communications Server is already running and you start a TCP62 client connection, the required TCP62 definitions must be in the default Communications Server configuration file, as those supplied in the client initialization file are ignored.

To configure Communications Server for non-automatic start:

1. Start Communications Manager Setup by selecting the **Setup** icon.

## TCP62 configuration

2. Open a configuration file.
3. On the Communications Manager Configuration Definitions window, select **Options**
4. Select **Configure any profile or feature**
5. Configure SNA local node characteristics—only Network ID and Local node name are required for TCP62.
6. Configure AnyNet Base Parameters—specify a SNA domain name suffix and set the default routing preference to:

<b>Non-native only</b>	If using TCP62 only.
<b>Non-native first</b>	If using TCP62 and SNA.
7. Add SNA definitions if required.

For more information, refer to the Communications Server documentation.

### Coexistence of TCP62 with SNA protocol on Windows NT/95

This section applies to CICS Client for Windows 95 and CICS Client for Windows NT only.

Depending on whether you wish to use TCP62 alone, or in coexistence with SNA protocols, you must install versions of Personal Communications as follows:

- **To use TCP62 but not SNA protocols:**

Install the Host TCP/IP Access Feature component of the CICS client. (This is a mini version of IBM Personal Communications supporting only TCP62. If any other Personal Communications support is required, you should install IBM Personal Communications Version 4.2 or later.)

- **To use TCP62 and SNA protocols:**

Do **not** install the CICS Host TCP/IP Access Feature component of the CICS client. Install IBM Personal Communications Version 4.2 or later to provide both SNA and TCP62 support. No other supported SNA product can be used with TCP62.

## APPC configuration

---

### APPC configuration

This section describes how to set up CICS clients for communication via the APPC protocol. Generally, the following are defined:

- The **local node characteristics** that are common to all APPC users at the workstation
- A **local logical unit (LU)** definition for the client
- A **partner logical unit (PLU)** definition for each CICS server with which the client will communicate
- One or more **mode** definitions to specify sets of session properties that are used in binding APPC sessions
- A **transaction program (TP)** definition for the CRSR transaction. This is required if terminal emulation is supported by the CICS servers, and it is necessary to perform automatic transaction initiation (ATI) against the CICS client terminals.

This definition is not required for CICS Client for OS/2 using Communications Manager/2.

**Note:** The terms used to describe these definitions vary with the product used to provide APPC support. The terms used above are the ones used by IBM Communications Manager/2.

Refer to the following road map for information on configuring particular APPC products:

<i>Table 17 (Page 1 of 2). APPC configuration for CICS Clients</i>	
To configure:	Refer to:
<b>CICS Client for DOS</b>	
IBM Client Access/400	"Client Access/400" on page 95
Novell NetWare for SAA	"Communication via a Novell Network" on page 96
<b>CICS Client for OS/2</b>	
IBM Communications Manager/2	"Communications Manager/2" on page 99
<b>CICS Client for Windows</b>	
IBM Client Access/400	"Client Access/400" on page 103
IBM APPC Networking Services for Windows	"APPC Networking Services for Windows" on page 103
Novell NetWare for SAA	"Communication via a Novell Network" on page 107
Microsoft SNA Server	"Microsoft SNA Server" on page 110
IBM Communications Server	"IBM Communications Server" on page 113
<b>CICS Client for Windows 95</b>	
Microsoft SNA Server	"Microsoft SNA Server" on page 113
IBM Communications Server	"IBM Communications Server" on page 114



## APPC configuration

Table 17 (Page 2 of 2). APPC configuration for CICS Clients

To configure:	Refer to:
IBM Personal Communications	"IBM Personal Communications" on page 115
Novell NetWare for SAA	"Communication via a Novell Network" on page 115
<b>CICS Client for Windows NT</b>	
Microsoft SNA Server	"Microsoft SNA Server" on page 119
IBM Communications Server	"IBM Communications Server" on page 119
IBM Personal Communications	"IBM Personal Communications" on page 121
Novell NetWare for SAA	"Communication via a Novell Network" on page 122

### CICS Client for DOS

The following sections summarize APPC configuration for CICS Client for DOS.

#### Client Access/400

Client Access/400 for DOS provides APPC communication to CICS/400, via the DOS Router.

For information on installing Client Access/400 for DOS, refer to the *Client Access/400 for DOS Setup*, SC41-3556 book.

To configure Client Access/400 for DOS for APPC communication, refer to *Client Access/400 for DOS Application Programming Interface Reference*.

For Client Access/400, the partner LU name is an 8-character PLU name rather than a fully qualified 17-character name. This partner LU name corresponds to NetName in the client initialization file. The NetName in the client initialization file must match the system name of a link specified by a TRLI identifier in the Client Access/400 configuration file. If you want to use the default remote system specified by the RTDN identifier in the Client Access/400 configuration file, then specify \* for NetName in the client initialization file.

The LocalLUName in the client initialization file is the unqualified Local LU name specified by the RTLN key in the CONFIG.PCS file.

You do not need to specify a value for ModeName in the client initialization file. This is because Client Access/400 always specifies the fixed modename of QPCSUPP.

Routing on CICS/400 must be set up using AEGISRTR and must be done in the same subsystem as that in which the normal Client Access/400 routing is done on the mode QPCSUPP. The routing entries for the CCIN, CPML, CTIN, and CRTE transactions must have a lower sequence number than any routing-table entry specifying comparison data of QPCSUPP starting in column 1 of the routing data, or PGMEVOKE starting in column 29 of the routing data. For full details, refer to the book *CICS/400: Intercommunication*, SC33-1388.

## APPC configuration

Before the CICS client is started, Client Access/400 must be started and links established.

### Communication via a Novell Network

You must install NetWare for SAA in the gateway, as described in the *Novell NetWare for SAA Administration Guide*. In the client, you must first install Novell 3270 LAN Workstation for DOS as described in the *Attachmate NetWare 3270 LAN Workstation for DOS User's Guide*, and then configure it for APPC as described in the *Attachmate NetWare 3270 LAN Workstation for DOS Configuration Guide*.

The client workstation must be configured to use expanded or extended memory, or both.

**CICSCLI.INI settings:** The Novell NetWare DOS client uses the APPC rather than the Common Programming Interface for Communication (CPI-C) API. However, some of the values required in the client initialization file are the same as those described for the CPI-C side information files in the Novell documentation. The following shows the mapping between the side information file names and the initialization file names:

#### Local LU configuration data

NetWare LU 6.2	CICSCLI.INI
Local LU name	LocalLUName
LU Local Address	SnaLocalLUAddr
LU Session Limit	SnaSessionLimit

#### Mode configuration data

NetWare LU 6.2	CICSCLI.INI
Data Link Control Name	SnaDLCName
Network Adapter Address	SnaPLUAdapterAddr

#### Remote LU configuration data

NetWare LU 6.2	CICSCLI.INI
Mode Name	Modename
Pacing Size	SnaPacingSize
Max RU Size	SnaMaxRUSize

For the client to use parallel sessions, a node type 2.1 service profile must be configured on the NetWare server. This uses independent LUs. For the client to use single sessions, a node type 2.0 service profile must be configured on the NetWare server to use dependent LUs.

For parallel session configurations, two sessions are established using the SNASVCMG mode. These sessions are in addition to the SnaSessionLimit sessions established using the ModeName defined in client initialization file.

## APPC configuration

For large networks or slow servers, you may need to increase the value of `SnaRetryCount` from the default.

The following applies to the `SnaLocalLUAddr` and `LocalLUName` settings in the client initialization file:

- To use an independent LU, set `SnaLocalLUAddr` to `X'00'`.
- To use a specific dependent LU, named in `LocalLUName`, set `SnaLocalLUAddr` to a value in the range `X'01'` to `X'FE'` to match that in the NetWare server profile.
- To use any available LU from a group of dependent LUs, set `SnaLocalLUAddr` to `X'FF'` and `LocalLUName` to the name of the LU group.
- To use any available dependent LU that is not a member of any LU group, set `SnaLocalLUAddr` to `X'FF'` and `LocalLUName` to `*`.

You should specify the Netname in the client initialization file as a fully qualified partner LU name, that is, an 8-character LU name prefixed with an 8-character network name, and separated by a period.

**Note:** In this release of IBM CICS Clients the network name prefix is ignored.

### **Restrictions**

- You can only configure NetWare for SAA Version 1.3 to use two NetWare server profiles at a time. However, you may be able to use one NetWare server profile to communicate with more than one CICS server.
- Each client/server link must use a different local LU.
- LU-LU verification security is not supported.
- If you wish to run ECI applications that supply user IDs and passwords, you must ensure that the CICS server you intend to use is correctly configured to use SNA conversation level security.

With NetWare for SAA Version 1.3 it is not possible to configure a server profile to use both dependent and independent LUs.

The NetWare for SAA Gateway Server must be started before the CICS client is started.

### **Definition checklists**

The following shows example definitions for connecting CICS Client for DOS to a CICS/ESA server:

## APPC configuration

### CICS server definitions

VTAM Definitions	Ref. Key	Example
NETID	<b>1</b>	USIBMC
LU	<b>2</b>	WXYZ9999
APPL	<b>3</b>	EFGH5678
Logmode	<b>4</b>	LU62PS
XID	<b>5</b>	05DA2072

CICS/ESA Version 3.3 Definitions	Ref. Key	Example
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
Applid (SIT parameter)	<b>3</b>	EFGH5678
Modename in the LU6.2 sessions definition	<b>4</b>	LU62PS
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

### CICS Client definitions

NetWare for SAA Definitions on the Gateway	Ref. Key	Example
SNA Network ID	<b>1</b>	USIBMC
BlockID/PUID	<b>5</b>	05DA2072

Client Initialization File	Ref. Key	Example
Server		CICSSNA
Netname	<b>3</b>	EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Modename	<b>4</b>	LU62PS
Driver		SNA
DriverName		CCLNOVSN

Ref. Key	VTAM	CICS/ESA V3.3	Netware for SAA	Client Initialization File	Example
<b>1</b>	NETID		SNA Network ID		USIBMC
<b>2</b>	LU	Netname		LocalLUName	WXYZ9999
<b>3</b>	APPL	Applid		Netname	EFGH5678
<b>4</b>	Logmode	Modename		Modename	LU62PS
<b>5</b>	XID		BlockID/PUID		05DA2072

## APPC configuration

### CICS Client for OS/2

The following sections summarize APPC configuration for CICS Client for OS/2.

#### Communications Manager/2

A Communications Manager/2 configuration is defined in a set of files as shown in Table 19.

<i>Table 19. Communications Manager/2 configuration files</i>	
<b>File</b>	<b>Contents</b>
<i>configname.CFG</i>	Communications Manager/2 configuration (.CFG) file
<i>configname.NDF</i>	Node definitions (.NDF) file
<i>configname.CF2</i>	SNA configuration (.CF2) file (copy of .NDF file)
<i>configname.SEC</i>	SNA security (.SEC) file
PROTOCOL.INI	LAN Adapter and Protocol Support (LAPS) configuration file

**Communications Manager/2 configuration (.CFG) file:** The Communications Manager/2 configuration (.CFG) file contains definitions that specify the environment within which the workstation operates.

The .CFG file is the central configuration file and is the minimum requirement for the installation or use of Communications Manager/2. When the workstation is connected to a LAN or an SNA network, you need additional files as indicated in Table 19.

Configuration files are not supplied for SNA network definitions or for LAN Adapter and Protocol Support.

**Node definitions (.NDF) file:** The node definitions (.NDF) file contains the node SNA network definitions in the form of system management configuration verbs.

The following definitions are included in the .NDF file:

- Local node characteristics
- Connection to peer node or primary host
- Connection to network node
- Local logical unit
- Partner logical unit
- Mode
- Transaction program

**SNA configuration (.CF2) file:** The SNA configuration (.CF2) file contains a binary translation of the .NDF file and is used to initialize the node SNA definitions when APPC is started.

**SNA security (.SEC) file:** The SNA security (.SEC) file contains SNA definitions for session-level and conversation-level security.

## APPC configuration

**APPC definitions:** For APPC communication, the following are defined:

- One **local node Characteristics** definition
- At least one **connection** definition
- A **local logical unit (LU)** definition
- A **partner logical unit (PLU)** definition for each CICS server with which the client will communicate
- One or more **mode** definitions to specify sets of session properties that are used in binding APPC sessions

### Definition checklists

The following shows example definitions for connecting CICS Client for OS/2 to a CICS/ESA server over token-ring:

#### CICS server definitions

VTAM Definitions	Ref. Key	Example
XID (IDBLK+IDNUM)	<b>1</b>	05DA2072
PU		
LU	<b>2</b>	WXYZ9999
Logmode	<b>3</b>	LU62PS
APPL	<b>4</b>	EFGH5678
NETID	<b>5</b>	ABCD1234

CICS/ESA V3.3 Definitions	Ref. Key	Example
Applid (SIT parameter)	<b>4</b>	EFGH5678
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
Modename in the LU6.2 sessions definition	<b>3</b>	LU62PS
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

#### CICS client definitions

Communications Manager/2 Definitions	Ref. Key	Example
Network ID	<b>5</b>	ABCD1234
Local node name		SJA2072
Local node ID	<b>1</b>	05DA2072
LAN Destination Address		400008210200
Local LU	<b>2</b>	WXYZ9999
Partner LU	<b>4</b>	EFGH5678
Mode name	<b>3</b>	LU62PS
Transaction program		CRSR

## APPC configuration

Client Initialization File Definitions	Ref. Key	Example
Server		CICSSNA
Network.Netname	<b>5</b> . <b>4</b>	ABCD1234.EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Modename	<b>3</b>	LU62PS
Driver		SNA
DriverName		CCLIBMSN

Table 20. Matching definitions: CICS Client for OS/2 to CICS/ESA using Communications Manager/2

Ref. Key	VTAM	CICS/ESA V3.3	Communications Manager/2	Client Initialization File	Example
<b>1</b>	XID		Local node ID		05DA2072
<b>2</b>	LU	Netname	Local LU	LocalLUName	WXYZ9999
<b>3</b>	Logmode	Modename	Mode name	Modename	LU62PS
<b>4</b>	APPL	Applid	Partner LU	Netname	EFGH5678
<b>5</b>	NETID		Network ID	Network	ABCD1234

The following shows example definitions for connecting CICS Client for OS/2 to a CICS/VSE server over SDLC:

### CICS server definitions

VTAM Definitions	Ref. Key	Example
ADDR	<b>1</b>	C1
PU		
LU	<b>2</b>	WXYZ9999
APPL	<b>3</b>	EFGH5678
NETID	<b>4</b>	ABCD1234

CICS/VSE V2.2 Definitions	Ref. Key	Example
Applid (SIT parameter)	<b>3</b>	EFGH5678
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

## APPC configuration

### *CICS client definitions*

Communications Manager/2 Definitions	Ref. Key	Example
Local station address	<b>1</b>	C1
Network ID	<b>4</b>	ABCD1234
Local node name		SJA2072
Local LU	<b>2</b>	WXYZ9999
Partner LU	<b>3</b>	EFGH5678
Transaction program		CRSR

Client Initialization File Definitions	Ref. Key	Example
Server		CICSSNA
Network.Netname	<b>4</b> . <b>3</b>	ABCD1234.EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Driver		SNA
DriverName		CCLIBMSN

<i>Table 21. Matching definitions: CICS Client for OS/2 to CICS/VSE using Communications Manager/2 over SDLC</i>					
Ref. Key	VTAM	CICS/VSE V2.2	Communications Manager/2	Client Initialization File	Example
<b>1</b>	XID		Local node ID		C1
<b>2</b>	LU	Netname	Local LU	LocalLUName	WXYZ9999
<b>3</b>	APPL	Applid	Partner LU	Netname	EFGH5678
<b>4</b>	NETID		Network ID	Network	ABCD1234



## APPC configuration

### CICS Client for Windows

The following sections summarize APPC configuration for CICS Client for Windows.

#### Client Access/400

Client Access/400 for Windows 3.1 supports SNA communication to CICS/400. The CICS client uses the Networking Services for Windows CPI-C communications provided by Client Access/400.

For information on installing Client Access/400 for Windows 3.1, refer to the *Client Access/400 for Windows 3.1 Setup*, SC41-3534 book.

You must configure a connection to the AS/400 system and a connection to the CICS/400 system. For the CICS/400 system connection:

- The PC network ID and system name must match the NetName parameter in the client initialization file.
- The PC location name must match the LocalLUName parameter in the client initialization file.
- The mode configured in the Advanced LAN options must match the ModeName parameter in the client initialization file. You can use the default QPCSUPP mode, or define additional modes in the NSD.INI file located in the \WINDOWS subdirectory. Refer to the Client Access/400 online help for further information.

If support for ATI against client terminals is required, you must define CRSR TP in the NSD.INI file in the \WINDOWS subdirectory, as follows:

```
[Configuration]
STARTPROGRAMLAUNCHER=TRUE

[DEFINETP]
CRSR=C:\CICSCLI\BIN\CCLSNWTP.EXE, 0, 30, AM_STARTED, CRSR
```

Routing on CICS/400 must be set up using AEGISRTR and must be done in the same subsystem as that in which the normal Client Access/400 routing is done on the mode QPCSUPP. The routing entries for the CCIN, CPMI, CTIN, and CRTE transactions must have a lower sequence number than any routing-table entry specifying comparison data of QPCSUPP starting in column 1 of the routing data, or PGMEVOKE starting in column 29 of the routing data. For full details, refer to the book *CICS/400: Intercommunication*, SC33-1388.

Before you start the CICS client, you must start Client Access/400 and establish the server connections.

#### APPC Networking Services for Windows

APPC support can be provided by APPC Networking Services for Windows. For information on installing this program, see the *APPC Networking Services for Windows: Getting Started* book.

## APPC configuration

**Note:** APPC Networking Services for Windows cannot run in the WIN-OS2 subsystem of OS/2.

To use APPC Networking Services for Windows, you must provide configuration information. Some configuration information is required when you install APPC Networking Services for Windows. Other configuration information can be provided either when you start APPC Networking Services for Windows or after you have started APPC Networking Services for Windows. To provide configuration information when you start APPC Networking Services for Windows, you must create or customize the configuration file NSD.INI. This file must reside in the WINDOWS subdirectory of the directory in which Windows was installed. The NSD.INI file includes the following sections:

- [Configuration]

This section specifies the type of communications adapter you use, the local LU name for your workstation, and other information. The LocalLUName in the client initialization file is not used. The fully qualified version of the LU name must be defined in the LOCALNAME statement.

**Note:** The node id must match the node ID configured in VTAM. Otherwise, the CICS client may be unresponsive when it tries to connect to the CICS server.

- [LAN]

This section defines the links. The link name defined in the TRLD statement must be the unqualified 8-character PLU name.

- [MODES]

This section specifies mode characteristics for sessions between your workstation and a remote computer. This section must include the modes that are used in the client initialization file.

- [SIDEINFO]

This section provides side information required by a CPI-C program to communicate with a partner program on a remote computer. Side information indicates:

- TP name
- LU name
- The mode name.

You do not need to make any definitions for CICS clients.

- [DEFINETP]

This section provides information used to access incoming Attaches and to start programs on your workstation. You may need to add a definition for the CRSR transaction. This is required if terminal emulation is supported by the CICS server, and you want to perform ATI against client terminals.

You should set up the CRSR definition as follows:

<b>Transaction Program Name</b>	CRSR
---------------------------------	------

## APPC configuration

<b>File Specification</b>	C:\CICSCLIB\BIN\CCLSNWTP.EXE
<b>Program Parameters</b>	CRSR
<b>Incoming Attach Time-out</b>	30 (the default)
<b>Accept_Conversation Time-out</b>	0 (the default)
<b>Transaction Program Operation</b>	ATTACH MANAGER STARTED

To provide configuration information after you start APPC Networking Services for Windows, or to change information that has already been provided, you can use node operator application program interface (API) verbs. These verbs can be issued by application programs, or you can issue them through the Windows user interface or from the DOS command prompt.

For more information on configuring APPC Networking Services for Windows, refer to the *APPC Networking Services for Windows: Configuration Parameters Reference for Administrators and Application Programmers*.

**Note:** APPC Networking Services for Windows is an independent LU type 6.2., physical unit (PU) type 2.1. It cannot be configured as a dependent LU.

You can use the Check Connection (APING) program on the APPC Networking Services for Windows desktop. This sample CPI-C program checks the connection between the workstation and a remote computer.

**Restrictions:** If you are using APPC Networking Services for Windows, it is not possible to define the PUs to have any LU2 sessions.

### Definition checklists

The following shows example definitions for connecting CICS Client for Windows to a CICS/ESA server over token-ring:

#### CICS server definitions

VTAM Definitions	Ref. Key	Example
XID (IDBLK+IDNUM)	<b>1</b>	05DA2072
PU		
LU	<b>2</b>	WXYZ9999
Logmode	<b>3</b>	LU62PS
APPL	<b>4</b>	EFGH5678

CICS/ESA V3.3 Definitions	Ref. Key	Example
Applid (SIT parameter)	<b>4</b>	EFGH5678
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
Modename in the LU6.2 sessions definition	<b>3</b>	LU62PS
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

## APPC configuration

### *CICS client definitions*

APPC Networking Services for Windows Definitions	Ref. Key	Example
Network ID	<b>5</b>	ABCD1234
Local LU	<b>2</b>	WXYZ9999
Connection Type		LAN
Link Name		CICSESA
LAN Destination Address		400008210200
Mode name	<b>3</b>	LU62PS
Transaction program		CRSR
Node ID (in NSD.INI file)	<b>1</b>	05DA2072

Client Initialization File Definitions	Ref. Key	Example
Server		CICSSNA
Network.Netname	<b>5</b> . <b>4</b>	ABCD1234.EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Modename	<b>3</b>	LU62PS
Driver		SNA
DriverName		CCLIBMSN

*Table 22. Matching definitions: CICS Client for Windows to CICS/ESA using APPC Networking Services for Windows over token-ring*

Ref. Key	VTAM	CICS/ESA V3.3	APPC Networking Services for Windows	Client Initialization File	Example
<b>1</b>	XID		Local node ID		05DA2072
<b>2</b>	LU	Netname	Local LU	LocalLUName	WXYZ9999
<b>3</b>	Logmode	Modename	Mode name	Modename	LU62PS
<b>4</b>	APPL	Applid	Partner LU	Netname	EFGH5678
<b>5</b>	NETID		Network ID	Network	ABCD1234

The following shows example definitions for connecting CICS Client for Windows to a CICS/VSE server over SDLC:

### *CICS server definitions*

VTAM Definitions	Ref. Key	Example
PU		
ADDR	<b>1</b>	C1
LU	<b>2</b>	WXYZ9999
APPL	<b>3</b>	EFGH5678
NETID	<b>4</b>	ABCD1234

## APPC configuration

CICS/VSE V2.2 Definitions	Ref. Key	Example
Applid (SIT parameter)	<b>3</b>	EFGH5678
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

### CICS client definitions

APPC Networking Services for Windows Definitions	Ref. Key	Example
Network ID	<b>4</b>	ABCD1234
Local LU	<b>2</b>	WXYZ9999
Connection Type		SDLC
Link Name		CICSVSE
Local station address	<b>1</b>	C1
Transaction program		CRSR

Client Initialization File Definitions	Ref. Key	Example
Server		CICSSNA
Network.Netname	<b>4</b> . <b>3</b>	ABCD1234.EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Driver		SNA
DriverName		CCLIBMSN

Table 23. Matching definitions: CICS Client for Windows to CICS/VSE using APPC Networking Services for Windows over SDLC

Ref. Key	VTAM	CICS/VSE V2.2	APPC Networking Services for Windows	Client Initialization File	Example
<b>1</b>	ADDR		Local Station Address		C1
<b>2</b>	LU	Netname	Local LU name	LocalLUName	WXYZ9999
<b>3</b>	APPL	Applid		Netname	EFGH5678
<b>4</b>	NETID		Network ID	Network	ABCD1234

### Communication via a Novell Network

You must install NetWare for SAA in the gateway, as described in the *Novell NetWare for SAA Administration Guide*. In the client, you must install Novell NetWare LU6.2 for Windows, (which is included in the NetWare for SAA product), as described in the *NetWare LU6.2 for Windows Configuration Guide*.

**Note:** NetWare for SAA cannot run in the WIN-OS2 subsystem of OS/2.

## APPC configuration

You must then configure NetWare LU6.2 for Windows for APPC communication with CICS servers. This is also described in the *Configuration Guide*.

The client workstation must be configured to use expanded or extended memory, or both.

For parallel session configurations, two sessions are established using the SNASVCMG mode. These sessions are in addition to the SnaSessionLimit sessions established using the ModeName defined in the client initialization file.

The protocol boundary can be loaded prior to starting the client, or can be automatically loaded by the client. You can predefine the server name, user name, and service name in the WS.CFG file in the WINDOWS directory. If you do not predefine these, you are prompted for them at run time (together with the password, if security is in use). For example:

```
[LU62]
TRANS_FILE = TABLE.DAT
LU_TYPE = 6
NETWARE_SAA_SERVER      = CICSNET
NETWARE_SAA_USER_NAME  = SUPERVISOR
NETWARE_SAA_SERVICE_NAME = ESA_21
TRAN_SPX_READ_DOS_MEMORY = 8192
TRAN_SPX_GLOBAL_MEMORY = 64000
```

To avoid WTSPX transport errors:

- Set the following in the WS.CFG file:  
TRAN\_SPX\_GLOBAL\_MEMORY = 64000  
TRAN\_SPX\_REAL\_DOS\_MEMORY = 8192  
TRACE\_MSG = 0
- Ensure that all Open Data Link Interface (ODI) drivers are loaded into conventional memory.

**CICSCLI.INI settings:** The Novell NetWare Windows client uses the APPC rather than the Common Programming Interface for Communication (CPI-C) API. However, some of the values required in the client initialization file are the same as those described for the CPI-C side information files in the Novell documentation.

Some of the values in the CPI-C side information files must be used in preparing the client initialization file. The following shows the mapping between the information file names and the initialization file names:

### Local LU configuration data

NetWare LU 6.2	CICSCLI.INI
Local LU name	LocalLUName

## APPC configuration

LU Local Address	SnaLocalLUAddr
LU Session Limit	SnaSessionLimit

### *Mode configuration data*

<b>NetWare LU 6.2</b>	<b>CICSCLI.INI</b>
Data Link Control Name	SnaDLCName
Network Adapter Address	SnaPLUAdapterAddr

### *Remote LU configuration data*

<b>NetWare LU 6.2</b>	<b>CICSCLI.INI</b>
Mode Name	Modename
Pacing Size	SnaPacingSize
Max RU Size	SnaMaxRUSize

For the client to use parallel sessions, a node type 2.1 service profile must be configured on the NetWare server. This uses independent LUs. For the client to use single sessions, a node type 2.0 service profile must be configured on the NetWare server to use dependent LUs.

For parallel session configurations, two sessions are established using the SNASVCMG mode. These sessions are in addition to the SnaSessionLimit sessions established using the ModeName defined in client initialization file.

For large networks or slow servers, you may need to increase the value of SnaRetryCount from the default.

The following rules apply to the SnaLocalLUAddr and LocalLUName settings in the client initialization file:

- To use an independent LU, set SnaLocalLUAddr to X'00'.
- To use a specific dependent LU, named in LocalLUName, set SnaLocalLUAddr to a value in the range X'01' to X'FE' to match that in the NetWare server profile.
- To use any available LU from a group of dependent LUs, set SnaLocalLUAddr to X'FF' and LocalLUName to the name of the LU group.
- To use any available dependent LU that is not a member of any LU group, set SnaLocalLUAddr to X'FF' and LocalLUName to \*.

You should specify the NetName in the client initialization file as a fully qualified partner LU name, that is, an 8-character LU name prefixed with an 8-character network name, and separated by a period.

**Note:** In this release of IBM CICS Clients the network name prefix is ignored.

## APPC configuration

**Restrictions:** The restrictions are essentially the same as for NetWare for SAA in the CICS Client for DOS environment, see “Restrictions” on page 97.

The NetWare for SAA Gateway Server must be started before the CICS client is started.

**NetWare for SAA Version 2.0:** In addition you must configure the Global Data and the LU6.2 Server List.

**NetWare for SAA Version 2.2:** In addition you must:

- Run NWSAA Administrator to configure the NWSAA node and peer connections on the NetWare Server.
- Configure a peer PU profile or use the default peer profile for the CICS client, which is an APPC/PC TP. This is described in the *NetWare for SAA Version 2.2 Getting Started* book.

You must **not** configure any APPC definitions on the NetWare Server.

### Definition checklists

The definitions are the same as for CICS Client for DOS.

### Microsoft SNA Server

APPC support can be provided by Microsoft SNA Server. In this case, CICS Client for Windows will be installed on a machine that has SNA Server client installed. Communication with the CICS server is therefore through the SNA Server machine.

For information on installing and configuring Microsoft SNA Server, and SNA Server clients, see the *Microsoft SNA Server Installation Guide*, and the *Microsoft SNA Server Administration Guide*.

To allow workstations using the Windows SNA Client to communicate with other systems, the LUs used by the client systems should be defined as **Local APPC LUs** to the SNA Server workstation.

**Setting up the SNA Server Windows client:** On the SNA Server Windows client, you require the following settings:

<b>SNA client mode</b>	Remote
<b>Primary Server</b>	Name of the SNA Server workstation that the client systems using SNA Client will use. This computer name of the SNA Server is displayed in both the SNA Server Admin <b>Servers and Connections</b> window, and in the <b>Network Settings</b> control panel dialog box.

Before you start the Server Windows 3.x client, you must run WNAP.EXE to start the SNA Server Client SnaBase. If you do not do so, the CICS Client will not be able to communicate with the SNA Server.



## APPC configuration

To receive ATI on SNA Server Windows 3.x client terminals, add the following to the WIN.INI file:

```
[SNAServerAutoTPs]
CRSR=xxxxxxx
```

```
[xxxxxxx]
PathName=d:\path\CCLSNSTP.EXE
Local LU=name
Parameters=CRSR
Queued=yes
```

Where *xxxxxxx* is any string naming the CRSR TP parameters, *d:\path* is the drive and path of the CICS Client code, and *name* is the name of the local LU configured for the connection.

### Definition checklists

The following shows example definitions for connecting CICS Client for Windows to a CICS/ESA server over token-ring:

#### CICS server definitions

VTAM Definitions	Ref. Key	Example
XID (IDBLK+IDNUM)	<b>1</b>	05DA2072
PU		
LU	<b>2</b>	WXYZ9999
Logmode	<b>3</b>	LU62PS
APPL	<b>4</b>	EFGH5678
NETID	<b>5</b>	ABCD1234

CICS/ESA V3.3 Definitions	Ref. Key	Example
Applid (SIT parameter)	<b>4</b>	EFGH5678
Netname in the LU6.2 connection definition	<b>2</b>	WXYZ9999
Modename in the LU6.2 sessions definition	<b>3</b>	LU62PS
<b>Note:</b> To enable Intersystem communication (ISC) on the CICS server, the DFHISC group must be installed.		

## APPC configuration

### *CICS client definitions*

SNA Server Definitions	Ref. Key	Example
Server Network Name	<b>5</b>	ABCD1234
Server LU Name	<b>2</b>	WXYZ9999
Server Connection Name		TOKEN1
Connection Type		802.2
Remote Network Address		400008210200
Local node ID	<b>1</b>	05DA2072
APPC Remote LU Properties: LU Name	<b>4</b>	EFGH5678
LU 6.2 Partners for EFGH5678	<b>2</b>	WXYZ9999
Mode	<b>3</b>	LU62PS

Client Initialization File Definitions	Ref. Key	Example
Server		CICSSNA
Network.Netname	<b>5</b> . <b>4</b>	ABCD1234.EFGH5678
Protocol		SNA
LocalLUName	<b>2</b>	WXYZ9999
Modename	<b>3</b>	LU62PS
Driver		SNA
DriverName		CCLWNTSN

<i>Table 24. Matching definitions: CICS Client for Windows to CICS/ESA using SNA Server</i>					
Ref. Key	VTAM	CICS/ESA V3.3	SNA Server	Client Initialization File	Example
<b>1</b>	XID		Local node ID		05DA2072
<b>2</b>	LU	Netname	Server LU Name	LocalLUName	WXYZ9999
<b>3</b>	Logmode	Modename	Mode	Modename	LU62PS
<b>4</b>	APPL	Applid	Remote LU Name	Netname	EFGH5678
<b>5</b>	NETID		Server Network Name	Network	ABCD1234

## APPC configuration

### IBM Communications Server

APPC support can be provided by IBM Communications Server. In this case, CICS Client for Windows will be installed on a machine that has Communications Server client for Windows 3.1 installed. Communication with the CICS server is therefore through the Communications Server machine.

For information on installing and configuring Communications Server, and Communications Server clients, see the *IBM Communications Server Up and Running Guide*.

You must run Configuration to configure Global Data and the LU6.2 Server List.

To enable ATI against CICS Client terminals, the transaction program CRSR must be defined on the SNA Client, as follows:

<b>TP name</b>	CRSR
<b>LU alias</b>	Alias of the local LU defined for the connection
<b>Complete pathname</b>	C:\CICSCLIB\BIN\CCLSNSTP.EXE
<b>Program operation</b>	Attach Manager Started
<b>Program parameters</b>	CRSR

The Attach Manager must be started.

### CICS Client for Windows 95

The following sections summarize APPC configuration for CICS Client for Windows 95.

#### Microsoft SNA Server

APPC support can be provided by Microsoft SNA Server. In this case, CICS Client for Windows 95 will be installed on a machine that has SNA Server client installed. Communication with the CICS server is therefore through the SNA Server machine.

For information on installing and configuring Microsoft SNA Server, and SNA Server clients, see the *Microsoft SNA Server Installation Guide*, and the *Microsoft SNA Server Administration Guide*.

To allow workstations using the Windows 95 SNA Client to communicate with other systems, the LUs used by the client systems should be defined as **Local APPC LUs** to the SNA Server workstation.

**Setting up the SNA Server Windows 95 client:** On the SNA Server Windows 95 client, you require the following settings:

<b>SNA client mode</b>	Remote
<b>Primary Server</b>	Name of the SNA Server workstation that the client systems using SNA Client will use. This computer name of the SNA Server is displayed in both the SNA Server

## APPC configuration

Admin **Servers and Connections** window, and in the **Network Settings** control panel dialog box.

To receive ATI on SNA Server Windows 95 client terminals, you must run the CCLMSATI command to configure the SNA Server Client for the CRSR transaction. The syntax of the command is:

```
CCLMSATI luname
```

where *luname* is the LocalLU you are using.

If CRSR is already configured, the LocalLU setting changes to match the new value.

Before you start the Server Windows 95 client, you must run SNABASE.EXE to start the SNA Server Client SnaBase. If you do not do so, the CICS Client will not be able to communicate with the SNA Server.

### Definition checklists

The definitions are the same as for CICS Client for Windows.

### IBM Communications Server

APPC support can be provided by IBM Communications Server. In this case, CICS Client for Windows 95 will be installed on a machine that has Communications Server client for Windows 95 installed. Communication with the CICS server is therefore through the Communications Server machine.

For information on installing and configuring Communications Server, and Communications Server clients, see the *IBM Communications Server Up and Running Guide*.

You must run Configuration to configure Global Data and the LU6.2 Server List.

To enable ATI against CICS Client terminals, the transaction program CRSR must be defined on the SNA Client, as follows:

<b>TP name</b>	CRSR
<b>LU alias</b>	Alias of the local LU defined for the connection
<b>Complete pathname</b>	C:\CICSCLIB\BIN\CCLCLNT.EXE
<b>Program operation</b>	Attach Manager Started
<b>Program parameters</b>	CRSR
<b>Service TP</b>	No
<b>Attach Manager Started</b>	No

The Attach Manager must be started.

## APPC configuration

### IBM Personal Communications

You must run 'SNA Node Configuration' to configure APPC support. Define a node, a device and a connection. Use an adjacent CP type of "APPN Node" or "Back-Level LEN" in the connection definition. Define the local LU, partner LU and mode specified in the client initialization file. You must configure the local LU to be independent.

The node must be started from 'SNA Node Operations' before starting a CICS client connection to a server that uses Personal Communications.

To enable ATI against CICS client terminals, the transaction program CRSR must be defined, as follows:

<b>TP name</b>	CRSR
<b>Service TP</b>	No
<b>Complete pathname</b>	C:\CICSCLI\BIN\CCLCLNT.EXE
<b>Program parameters</b>	CRSR
<b>Conversation type</b>	Mapped
<b>Synchronization level</b>	Any
<b>Conversation security required</b>	No
<b>Receive_Allocate timeout</b>	0
<b>Incoming allocate timeout</b>	default
<b>TP instance limit</b>	1
<b>PIP allowed</b>	No
<b>For SNA Client use</b>	Yes/No
<b>Dynamically loaded</b>	No
<b>Full duplex support</b>	No

**Operation of Personal Communications:** The SNA protocol driver requires that the IBM Personal Communications node is started before a CICS client SNA connection. The TCP62 protocol driver automatically starts the IBM Personal Communications node when a CICS client TCP62 connection is started, if it is not already running. If the node is started automatically the default configuration file is used, if there is one. If the node is started manually and the TCP62 protocol is required, an AnyNet SNA/IP device should be configured specifying the SNA domain name suffix in the DomainNameSuffix parameter in the client initialization file.

### Communication via a Novell Network

CICS Client for Windows NT and CICS Client for Windows 95 use the NetWare for SAA APPC API, while CICS Client for DOS and CICS Client for Windows 3.1 use the NetWare for SAA APPC/PC API. Bearing this in mind, you should refer to the relevant configuration information in the NetWare for SAA manuals accordingly.

To configure NetWare for SAA:

## APPC configuration

1. Install the following, on any client machine running NetWare for SAA Version 2.2 and connected to the NetWare for SAA server that you wish to configure.
  - NWSAA Services Manager (SSM)
  - NWSAA Administrator
  - NWADMIN Client Administrator

See NetWare for SAA Version 2.2 Installation manual, Chapter 2.

2. Start NWSAA Administrator:
  - a. Select the server you wish to configure.
  - b. Select **Functions**, then **Login To Server**.
  - c. Select the NetWare for SAA Node and configure the Peer PU profile default setting.
  - d. Select and configure **Data Link Adapters**.

To configure the NetWare for SAA server for CICS Client for Windows NT:

- a. Select **APPC**.
  - b. Configure a Local LU. You must specify the LU name in the LocalLUName parameter in CICSCLI.INI.
  - c. Configure a Partner LU. You must specify the Partner LU name in the NetName parameter in CICSCLI.INI, without the Network qualifier. You must also set LUAliasNames = Y.
  - d. Configure a mode. You must specify the mode name in the ModeName parameter in CICSCLI.INI.
  - e. If ATI processing is required, configure a Transaction Program as follows:

<b>Local TP name:</b>	CRSR
<b>Sync level:</b>	Confirmed
<b>Conversation type:</b>	Mapped
<b>Require conversation security:</b>	unchecked
  - f. No Host or Peer PU profile is required.
3. Start NetWare for SAA Services Manager as follows:
    - a. Create a new domain with the required NetWare for SAA server(s) in it.
    - b. Select the NetWare for SAA server containing the APPC configuration done in the previous step
    - c. Select **Server**, then **Link/Service Information** and check that there is a link to the required host.
    - d. Select **Server**, then **Independant LU6.2** and check that there are active sessions with the required partner LU. If there are not, reboot the NetWare for SAA server and check again. Once there are active sessions, you are ready to start the CICS Client.

## APPC configuration

4. If ATI processing is required: Start NetWare Administrator (NWADMIN95.EXE can be found on the NetWare for SAA server in \SYS\PUBLIC\WIN95).

a. For each user, select **APPC Configuration** and add an Attach Manager Record as follows:

**TP Name:** CRSR  
**TP Type:** STANDARD  
**TP Operation:** OPERATOR  
**TP Filename:** blank  
**TP Parms:** CRSR  
**TP Presentation:** blank  
**TP Icon Filename:** blank  
**LU Name:** Local LU name

b. For the NetWare for SAA server, select **APPC Configuration** and add an Attach Manager Record as follows:

**TP Name:** CRSR  
**TP Type:** STANDARD  
**TP Operation:** OPERATOR  
**TP Filename:** blank  
**TP Parms:** CRSR  
**TP Presentation:** blank  
**TP Icon Filename:** blank  
**LU Name:** blank

**Client initialization file configuration:** The following are sample server and driver definitions for the client initialization file for Windows NT and Windows 95 NetWare for SAA SNA connections:

```
Server = CICSSNA           ; Arbitrary name for the server
Description = NWSAA Server ; Arbitrary description for the server
Protocol = SNA             ; Matches with a Driver section below
NetName = EFGH5678        ; The partner LU name defined to NWSAA
LocalLUName = WXYZ9999    ; The local LU name defined to NWSAA
ModeName = LU62PS         ; The SNA communications mode name
LUAliasNames = Y          ; LU names are aliases - must be
                           ; specified when using NWSAA.
Driver = SNA               ; Matches the Server's Protocol value
DriverName = CCLWNTSN     ; Use the NWSAA SNA communications DLL
```

**Note:** The client initialization file parameters starting with Sna are not applicable for Windows NT or Windows 95 NetWare for SAA server definitions.

## APPC configuration

**Operation:** The NetWare for SAA Attach Manager must be started to enable ATI requests to be received.



## APPC configuration

### CICS Client for Windows NT

The following sections summarize APPC configuration for CICS Client for Windows NT.

#### Microsoft SNA Server

APPC support can be provided by Microsoft SNA Server. You can install SNA Server itself on the CICS Client for Windows NT machine, but it is more likely that you will install SNA Server client. Communication with the CICS server is therefore through the SNA Server machine.

For information on installing and configuring Microsoft SNA Server, and SNA Server clients, see the *Microsoft SNA Server Installation Guide*, and the *Microsoft SNA Server Administration Guide*.

To allow workstations using the Windows NT SNA Client to communicate with other systems, the LUs used by the client systems should be defined as **Local APPC LUs** to the SNA Server workstation.

**Setting up the SNA Server Windows NT client:** On the SNA Server Windows NT client, you require the following settings:

<b>SNA client mode</b>	Remote
<b>Primary Server</b>	Name of the SNA Server workstation that the client systems using SNA Client will use. This computer name of the SNA Server is displayed in both the SNA Server Admin <b>Servers and Connections</b> window, and in the <b>Network Settings</b> control panel dialog box.

To receive ATI on SNA Server Windows NT client terminals, you must run the CCLMSATI command to configure the SNA Server Client for the CRSR transaction. The syntax of the command is:

```
CCLMSATI luname
```

where *luname* is the LocalLU you are using.

If CRSR is already configured, the LocalLU setting changes to match the new value.

#### Definition checklists

The definitions are the same as for CICS Client for Windows.

#### IBM Communications Server

APPC support can be provided by IBM Communications Server. You can install Communications Server itself on the CICS Client for Windows NT machine, but it is more likely that you will install Communications Server Client for Windows NT. Communication with the CICS server is therefore through the Communications Server machine.

## APPC configuration

For information on installing and configuring Communications Server, and Communications Server clients, see the *IBM Communications Server Up and Running Guide*.

**Setting up the Communications Server Server:** You must run SNA Node Configuration to configure APPC support, define a connection and the local LU, partner LU and mode specified in the client initialization file. You must configure the local LU to be independent.

If using a Communications Server SNA Client, ensure that the **SNA API client use** check box, in the Local LU 6.2 definition panel, is selected.

To enable ATI against CICS Client terminals, the transaction program CRSR must be defined on the Communications Server, whether or not a Communications Server SNA Client is being used, as follows:

<b>TP name</b>	CRSR
<b>Service TP</b>	No
<b>Complete pathname</b>	C:\CICSCLIB\BIN\CCLCLNT.EXE
<b>Program parameters</b>	CRSR
<b>Conversation type</b>	Mapped
<b>Synchronization level</b>	Any
<b>Conversation security required</b>	No
<b>Receive_Allocate timeout</b>	0
<b>Incoming allocate timeout</b>	default
<b>TP instance limit</b>	1
<b>PIP allowed</b>	No
<b>For SNA Client use</b>	Yes/No
<b>Dynamically loaded</b>	No
<b>Full duplex support</b>	No

**Setting up the Communications Server Windows NT client:** You must run Configuration to configure Global Data and the LU6.2 Server List.

To enable ATI against CICS Client terminals, the transaction program CRSR must be defined on the SNA Client, as follows:

<b>TP name</b>	CRSR
<b>LU alias</b>	Alias of the local LU defined for the connection
<b>Complete pathname</b>	C:\CICSCLIB\BIN\CCLCLNT.EXE
<b>Program operation</b>	Attach Manager Started
<b>Program parameters</b>	CRSR

## APPC configuration

**Service TP** No  
**Attach Manager Started** No

The Attach Manager must be started.

### IBM Personal Communications

You must run 'SNA Node Configuration' to configure APPC support. Define a node, a device and a connection. Use an adjacent CP type of "APPN Node" or "Back-Level LEN" in the connection definition. Define the local LU, partner LU and mode specified in the client initialization file. You must configure the local LU to be independent.

The node must be started from 'SNA Node Operations' before starting a CICS client connection to a server that uses Personal Communications.

To enable ATI against CICS client terminals, the transaction program CRSR must be defined, as follows:

<b>TP name</b>	CRSR
<b>Service TP</b>	No
<b>Complete pathname</b>	C:\CICSCL\BIN\CCLCLNT.EXE
<b>Program parameters</b>	CRSR
<b>Conversation type</b>	Mapped
<b>Synchronization level</b>	Any
<b>Conversation security required</b>	No
<b>Receive_Allocate timeout</b>	0
<b>Incoming allocate timeout</b>	default
<b>TP instance limit</b>	1
<b>PIP allowed</b>	No
<b>For SNA Client use</b>	Yes/No
<b>Dynamically loaded</b>	No
<b>Full duplex support</b>	No

**Operation of Personal Communications:** The SNA protocol driver requires that the IBM Personal Communications node is started before a CICS client SNA connection. The TCP62 protocol driver automatically starts the IBM Personal Communications node when a CICS client TCP62 connection is started, if it is not already running. If the node is started automatically the default configuration file is used, if there is one. If the node is started manually and the TCP62 protocol is required, an AnyNet SNA/IP device should be configured specifying the SNA domain name suffix in the DomainNameSuffix parameter in the client initialization file.

## APPC configuration

### Communication via a Novell Network

CICS Client for Windows NT and CICS Client for Windows 95 use the NetWare for SAA APPC API, while CICS Client for DOS and CICS Client for Windows 3.1 use the NetWare for SAA APPC/PC API. Bearing this in mind, you should refer to the relevant configuration information in the NetWare for SAA manuals accordingly.

To configure NetWare for SAA:

1. Install the following, on any client machine running NetWare for SAA Version 2.2 and connected to the NetWare for SAA server that you wish to configure.
  - NWSAA Services Manager (SSM)
  - NWSAA Administrator

See NetWare for SAA Version 2.2 Installation manual, Chapter 2.

2. Start NWSAA Administrator:
  - a. Select the server you wish to configure.
  - b. Select **Functions**, then **Login To Server**.
  - c. Select the NetWare for SAA Node and configure the Peer PU profile default setting.
  - d. Select and configure **Data Link Adapters**.

To configure the NetWare for SAA server for CICS Client for Windows NT:

- a. Select **APPC**.
  - b. Configure a Local LU. You must specify the LU name in the LocalLUName parameter in CICSCLI.INI.
  - c. Configure a Partner LU. You must specify the Partner LU name in the NetName parameter in CICSCLI.INI, without the Network qualifier. You must also set LUAliasNames = Y.
  - d. Configure a mode. You must specify the mode name in the ModeName parameter in CICSCLI.INI.
  - e. If ATI processing is required, configure a Transaction Program as follows:

<b>Local TP name:</b>	CRSR
<b>Sync level:</b>	Confirmed
<b>Conversation type:</b>	Mapped
<b>Require conversation security:</b>	unchecked
  - f. No Host or Peer PU profile is required.
3. Start NetWare for SAA Services Manager as follows:
    - a. Create a new domain with the required NetWare for SAA server(s) in it.
    - b. Select the NetWare for SAA server containing the APPC configuration done in the previous step

## APPC configuration

- c. Select **Server**, then **Link/Service Information** and check that there is a link to the required host.
  - d. Select **Server**, then **Independent LU6.2** and check that there are active sessions with the required partner LU. If there are not, reboot the NetWare for SAA server and check again. Once there are active sessions, you are ready to start the CICS Client.
4. If ATI processing is required: Start NetWare Administrator (NWADMN95.EXE can be found on the NetWare for SAA server in \SYS\PUBLIC\WIN95).

- a. **For each user**, select **APPC Configuration** and add an Attach Manager Record as follows:

**TP Name:** CRSR  
**TP Type:** STANDARD  
**TP Operation:** OPERATOR  
**TP Filename:** blank  
**TP Parms:** CRSR  
**TP Presentation:** blank  
**TP Icon Filename:** blank  
**LU Name:** Local LU name

- b. **For the NetWare for SAA server**, select **APPC Configuration** and add an Attach Manager Record as follows:

**TP Name:** CRSR  
**TP Type:** STANDARD  
**TP Operation:** OPERATOR  
**TP Filename:** blank  
**TP Parms:** CRSR  
**TP Presentation:** blank  
**TP Icon Filename:** blank  
**LU Name:** blank

**Client initialization file configuration:** The following are sample server and driver definitions for the client initialization file for Windows NT and Windows 95 NetWare for SAA SNA connections:

## APPC configuration

```
Server = CICSSNA           ; Arbitrary name for the server
  Description = NWSAA Server ; Arbitrary description for the server
  Protocol = SNA           ; Matches with a Driver section below
  NetName = EFGH5678       ; The partner LU name defined to NWSAA
  LocalLUName = WXYZ9999   ; The local LU name defined to NWSAA
  ModeName = LU62PS        ; The SNA communications mode name
  LUAliasNames = Y         ; LU names are aliases - must be
                           ; specified when using NWSAA.
Driver = SNA                ; Matches the Server's Protocol value
  DriverName = CCLWNTSN    ; Use the NWSAA SNA communications DLL
```

**Note:** The client initialization file parameters starting with Sna are not applicable for Windows NT or Windows 95 NetWare for SAA server definitions.

**Operation:** The NetWare for SAA Attach Manager must be started to enable ATI requests to be received.

## APPC configuration

### CICS Client for Macintosh

For CICS Client for Macintosh, APPC communication with a CICS server is achieved via a SNA•ps gateway.

You must install the SNA•ps Gateway software in the gateway machine as described in the *SNA•ps Administrator's Guide*. SNA•ps installation and AppleTalk installation is also described in the *IBM/Apple Enterprise Networking Guide for SNA Products* book. This book provides an overview of Apple/SNA networking and gives examples of the ways in which SNA•ps can be configured for APPC communication.

You must then configure SNA•ps Gateway for use with a CICS server. You can use one of the supplied configuration files as a basis. The general procedure is:

1. Select the SNA•ps Config icon in the SNA•ps folder. The SNA•ps Config resources window is displayed.
2. Select the line type as Token Ring, SDLC, or Coax and enter the line information.
3. Enter the correct settings for the partner.
4. Enter the correct settings for the Local 6.2 LUs, that is the local LUs.
5. Enter the correct settings for the transaction programs (TP).
6. Enter the correct settings for the Remote 6.2 LUs, that is, the partner LUs.
7. Enter the correct settings for the modes.
8. Save the configuration file.
9. Select the SNA•ps Admin icon in the SNA•ps folder. The Network Gateway Status window is displayed. Assign the configuration file to the required gateway.

**Note:** The APPC Remote LU name must be used for the NetName parameter in the client initialization file.

The SNA•ps Gateway will normally be configured to automatically activate the connection to the host on startup of the Gateway workstation. You can also use the SNA•ps Admin application to:

- Stop or start, and verify the correctness of the configuration
- Confirm that sessions are successfully established with the host
- Stop or start line traces when communication problems need detailed investigation

**Note:** While it is possible for several CICS Client for Macintosh systems to use the same LocalLUName at the same time (all concentrated through a common SNA•ps Gateway machine) this is not recommended, as incoming Allocates may be routed to the wrong client. Unless all you are using under the client is ECI applications, you should define multiple Local LUs in your SNA•ps configuration file and use a different one in each CICS Client for Macintosh connected through the Gateway.

## CICS clients in Novell NetWare LANs

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### CICS clients in Novell NetWare LANs

**Note**

The procedures described in this section may be not be necessary, depending on the Novell NetWare LAN support provided by the operating system you are using. If you are in doubt about this, refer to the documentation supplied with your operating system.

You can install CICS clients on workstations that are part of a Novell NetWare LAN. Such CICS clients can run transactions on a CICS for OS/2 server just as they can in an IBM LAN Server network.

Novell LANs normally use the Internet Packet Exchange (IPX) protocol, rather than IBM's NetBIOS for their LAN transport, but you can overcome this in two ways:

1. **Coexistence with Novell's IPX**

CICS clients can run on Novell NetWare workstations by making use of Novell's Open Data-Link Interface (ODI). The ODI enables a workstation to support multiple communication protocols over a *single* network adapter. Therefore by using the ODI, a workstation can run a CICS client over either NetBIOS or TCP/IP, *and* access a NetWare file server over IPX. This requires no change to the setup of the CICS for OS/2 server because it receives normal NetBIOS or TCP/IP flows.

2. **Novell's emulation of NetBIOS over IPX**

Novell's NetBIOS emulator enables distributed client/server NetBIOS applications to run over IPX on a Novell LAN. NetBIOS emulator flows are transmitted with IPX headers. NetBIOS emulation is available on DOS, Windows and OS/2 workstations.

CICS clients and CICS for OS/2 can use this emulator program. It means that a workstation can use IPX to access both a Novell file server and a CICS for OS/2 application server.

When a workstation is configured to use Novell's NetBIOS emulator program it will only accept IPX flows, and will not accept native NetBIOS flows. Therefore, the CICS for OS/2 server will *only* accept input from CICS client workstations that have also been configured to use Novell's NetBIOS emulator over IPX.

Both of these techniques result in the same operation for end users.

**Note:** There are different ways in which coexistence and NetBIOS emulation can be achieved. This book describes techniques for token ring networks. You may have to adapt the described techniques to your own environment.

### An overview of the Open Data-Link Interface

Novell's ODI supports multiple protocols and multiple LAN adapters in a single workstation. The implementation of ODI is shown in Figure 17 on page 127.



## CICS clients in Novell NetWare LANs

You can use more than one protocol on the same LAN cabling because the link support layer (LSL) part of the ODI allows the LAN driver for an adapter to service more than one protocol.

Open Data-Link Interface Network driver interface specification Support (ODINSUP) is an interface that allows the coexistence of ODI and Network Driver Interface Specification (NDIS). ODINSUP therefore allows LAN Server or other NDIS protocols to coexist with NetWare's ODI on a network.

When OS/2 LAN Requester or Extended Services is installed with NetBIOS support, a *LAN adapter-specific* NDIS LAN driver is installed and loaded in CONFIG.SYS. For example, in an IBM token ring network, the IBMTOK.OS2 NDIS MAC (Medium Access Control) driver is installed. To allow coexistence with NetWare Requester for OS/2, the NDIS LAN driver must be replaced with TOKEN.SYS (the ODI LAN driver for IBM token ring).

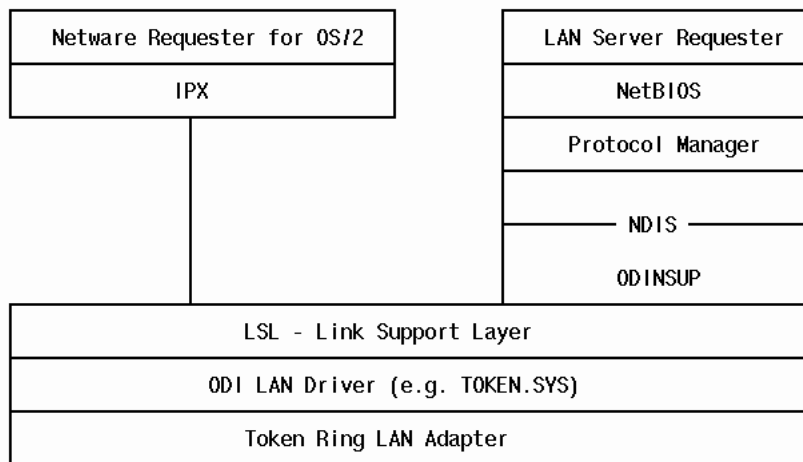


Figure 17. Implementation of Novell's ODI layer and driver

For further information on ODI, refer to the publications:

*NOVELL: NetWare ODI Shell for DOS*

*NOVELL: NetWare Requester for OS/2.*

### Coexistence with Novell's IPX

This section describes how to set up a workstation both as a NetWare Requester and as an IBM LAN Server Requester. It assumes that the LAN Server software has already been installed.

### NetWare DOS and Windows Requesters running CICS clients

## CICS clients in Novell NetWare LANs

The following procedure allows coexistence between LAN Server and NetWare, using NetWare ODI drivers, in a token ring network. For more information refer to *Coexistence Guide for OS/2 LAN Server and NetWare from IBM*.

1. Install IBM LAN Support Program using the default values.
2. In the CONFIG.SYS file, add the parameter O=Y to the DXMT0MOD.SYS device driver line so that the adapter is opened at startup. The CONFIG.SYS file should therefore contain lines like the following:

```
DEVICE=\DXMA0MOD.SYS 001
DEVICE=\DXMC0MOD.SYS
DEVICE=\DXMT0MOD.SYS S=12 C=14 ST=12 O=Y
```

3. Install NetWare Requester using the ODI drivers.
  - a. Create a \NETWARE subdirectory on drive C, and then copy the necessary modules from the DOS/DOS ODI Workstation Services diskette (subdirectory \DOSODI) to the directory you created:

```
LSL.COM
LANSUP.COM
IPXODI.COM
ROUTE.COM (if you need source routing).
```

- b. Copy the NetWare shell NETX.COM, from the DOS/DOS ODI Workstation Services diskette to the \NETWARE subdirectory.
- c. Add the C:\NETWARE directory to the path in the AUTOEXEC.BAT file, and then add the following lines at the end of the file:

```
LSL
LANSUP
ROUTE
IPXODI
NETX
```

### NetWare OS/2 Requester running CICS Client for OS/2

The following describes the procedure for a token ring network. For more information refer to *Coexistence Guide for OS/2 LAN Server and NetWare from IBM*.

1. Install NetWare Requester for OS/2 Version 2.0.1.
2. You must now configure the ODINSUP interface for token ring operation:
  - a. First you must replace each NDIS MAC driver name with the ODI driver name. Edit the PROTOCOL.INI file to replace all occurrences of:

```
bindings = IBMTOK_nif
```

with:

```
bindings = TOKEN
```

- b. Next, you must prevent NDIS MAC drivers from loading. In CONFIG.SYS, comment out the line:

```
DEVICE=C:\IBMLAN\MACS\IBMTOK.OS2
```

## CICS clients in Novell NetWare LANs

- c. In CONFIG.SYS, add the line:

```
DEVICE=C:\NETWARE\ODINSUP.SYS
```

Make sure that the new ODINSUP driver comes after the line:

```
DEVICE=C:\NETWARE\ROUTE.SYS
```

- d. Now, you must enable the frame types and bind ODINSUP to your LAN driver.  
In the NET.CFG file, add the following lines:

```
link driver TOKEN
  frame token-ring
  frame token-ring_snap
```

```
protocol odinsup
  bind TOKEN
```

3. Restart the workstation.

This procedure results in a CONFIG.SYS (see Figure 18) and PROTOCOL.INI file (see Figure 19 on page 130) like the following:

```
REM --- NetWare Requester statements BEGIN ---
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE

REM -- ODI-Driver Files BEGIN --
DEVICE=C:\NETWARE\TOKEN.SYS
DEVICE=C:\NETWARE\ROUTE.SYS

REM ***** Next line added manually *****
DEVICE=C:\NETWARE\ODINSUP.SYS
REM -- ODI-Driver Files END --

DEVICE=C:\NETWARE\IPX.SYS
rem DEVICE=C:\NETWARE\SPX.SYS
rem RUN=C:\NETWARE\SPDAEMON.EXE
rem DEVICE=C:\NETWARE\NMPIPE.SYS
rem DEVICE=C:\NETWARE\NPSEVER.SYS
rem RUN=C:\NETWARE\NPDAEMON.EXE
DEVICE=C:\NETWARE\NWREQ.SYS
IFS=C:\NETWARE\NWIFS.IFS
RUN=C:\NETWARE\NWDAEMON.EXE
rem DEVICE=C:\NETWARE\NETBIOS.SYS
rem RUN=C:\NETWARE\NBDAEMON.EXE
rem DEVICE=C:\NETWARE\VIPX.SYS
rem DEVICE=C:\NETWARE\VSHELL.SYS PRIVATE
REM --- NetWare Requester statements END ---
```

Figure 18. Statements added to CONFIG.SYS for coexistence

## CICS clients in Novell NetWare LANs

```
[PROT_MAN]

    DRIVERNAME = PROTMAN$

[IBMLXCFG]

    IBMTOK_nif = IBMTOK.nif
    LANDD_nif = LANDD.NIF
    NETBEUI_nif = NETBEUI.NIF

[LANDD_nif]

    DriverName = LANDD$
; Bindings = IBMTOK_nif - This line manually replaced by next
Bindings = TOKEN
    NETADDRESS = "08005a0347bf"
    ETHERAND_TYPE = "I"
    SYTEM_KEY = 0x0
    OPEN_OPTIONS = 0x2000
    TRACE = 0x0
    LINKS = 8
    MAX_SAPS = 3
    MAX_G_SAPS = 0
    USERS = 3
    T1_TICK_G1 = 255
    T1_TICK_G1 = 15
    T2_TICK_G1 = 3
    T1_TICK_G2 = 255
    T1_TICK_G2 = 25
    T2_TICK_G2 = 10
    IPACKETS = 250
    UIPACKETS = 100
    MAXTRANSMITS = 6
    MINTRANSMITS = 2
    TCBS = 64
    GDTS = 30
    ELEMENTS = 800
```

Figure 19 (Part 1 of 2). Example of PROTOCOL.INI after setting up coexistence

## CICS clients in Novell NetWare LANs

```
[NETBEUI_nif]

DriverName = netbeui$
; Bindings = IBMTOK_nif - This line manually replaced by next
  Bindings = TOKEN
NETADDRESS = "08005a0347bf"
ETHERAND_TYPE = "I"
USEADDRREV = "YES"
OS2TRACEMASK = 0x0
SESSIONS = 210
NCBS = 250
NAMES = 40
SELECTORS = 5
USEMAXDATAGRAM = "NO"
ADAPTRATE = 1000
WINDOWERRORS = 0
MAXDATARCV = 4168
TI = 30600
T1 = 500
T2 = 200
MAXIN = 1
MAXOUT = 1
NETBIOS_TIMEOUT = 500
NETBIOSRETRIES = 8
NAMECACHE = 0
PIGGYBACKACKS = 1
DATAGRAMPACKETS = 2
PACKETS = 350
LOPPACKETS = 1
PIPELINE = 5
MAXTRANSMITS = 6
MINTRANSMITS = 2
DLCRETRIES = 5
NETFLAGS = 0x0

[IBMTOK_nif]

DriverName = IBMTOK$
ADAPTER = "PRIMARY"
MAXTRANSMITS = 6
RECVBUFS = 2
RECVBUFSIZE = 256
XMITBUFS = 1
```

Figure 19 (Part 2 of 2). Example of PROTOCOL.INI after setting up coexistence

## CICS clients in Novell NetWare LANs

### Novell's emulation of NetBIOS over IPX

Novell's NetBIOS emulator supports two kinds of NetBIOS: NetBIOS NB30 and NetBIOS Submit. For communication with CICS for OS/2, NetBIOS NB30 is required. For more information refer to the *NOVELL: NetWare Requester for OS/2* manual.

#### Setting up the CICS server

For the CICS for OS/2 system to act as the CICS server on a Novell LAN and use Novell's NetBIOS emulator, the workstation must be configured in a similar manner to an OS/2 NetWare Requester workstation, but with extra steps to allow the use of NetBIOS. The stages in the configuration process are:

1. Configure the workstation as a NetWare Requester
2. Install IBM NetWare Requester Support from LAPS
3. Bind the NetBIOS protocol to the adapter.

The process is described in the *CICS for OS/2 Intercommunication* book, and is essentially the same as for setting up CICS Client for OS/2 on a Novell LAN.

#### Setting up CICS Client for DOS

1. Install the NetWare DOS Requester code.
2. Install and configure NetWare NetBIOS emulation:
  - a. The file NETBIOS.EXE (the NetBIOS emulator program) should have been copied to your hard disk during installation of the NetWare client code. If not, locate the file on the NetWare disks and copy it.
  - b. In the file C:\NWCLIENT\STARTNET.BAT (see Figure 22 on page 137), add the line:  
NETBIOS  
  
*immediately before* the line:  
CD \
  - c. Restart the workstation to confirm that NetBIOS support will correctly load at startup.

#### Setting up CICS Client for OS/2

You set up the client in three steps:

##### Step 1—Configure the workstation as a NetWare OS/2 Requester

You must first configure the workstation as a NetWare OS/2 Requester with NetBIOS emulator support:

1. Insert the Novell *Workstation for OS/2* diskette and enter A:\install at the command prompt.
2. Select the **Requester on Workstation** option from the **Installation** pull down menu.
3. Enter a directory in the Set Target Directory panel, if you do not want the default.

## CICS clients in Novell NetWare LANs

4. On the Requester Installation panel, select **Edit CONFIG.SYS and Copy All Files**.
5. Enter the name of the LAN driver required, for example, TOKEN.SYS, or select a driver from the list.
6. In the next panel select **On** or **Off** for **IPX Support for DOS and Windows**. (This is not critical for NetBIOS emulation.)
7. On the Choose Optional Protocols panel, select **NetBIOS Emulation for OS/2 Sessions**. Select **On** or **Off** for **Remote Named Pipes Support**. (This is not critical for NetBIOS emulation.)
8. Select **Save** and allow the installation to complete in the usual way.
9. Ignore the instruction to restart at this stage.

The statements added to CONFIG.SYS are shown in Figure 20 on page 134.

### Step 2—Install IBM NetWare Requester Support from LAPS

The LAN adapter and protocol support (LAPS) program is used to configure the protocol to the adapter. LAPS is discussed in the *CICS for OS/2 Intercommunication* book. You can obtain LAPS from different sources; in this technique it is obtained from IBM Network Transport Services/2 (NTS/2). (See the *NTS/2 Lan Adapter and Protocol Support Configuration Guide*.)

1. From the configure function of LAPS, display the Configure Workstation panel.
2. In the **Protocols** listbox in the Configure Workstation panel, select the **IBM OS/2 NetBIOS** and **IBM NetWare Requester Support** protocols and add them using the **Add** button. This adds the protocols to the **Current Configuration** listbox.
3. Select the **IBM NetWare Requester Support** protocol from the **Current Configuration** listbox and edit its parameters by selecting the **Edit** button. The Parameters for IBM NetWare Requester Support panel is then displayed.
4. Enter the hexadecimal address of the workstation's adapter card into the **Network Adapter Address** field. You can find this address in the LANTRAN.LOG file.
5. Complete the configuration of LAPS in the usual way.
6. Do not restart the system at this stage.

This step adds ODI2NDI.OS2, which maps the lower-level NDIS protocol APIs to the upper layer ODI APIs.

### Step 3—Bind the NetBIOS protocol to the adapter

The NetBIOS protocol added in the above steps must now be bound to the adapter as follows:

1. Edit the file C:\IBMCOM\PROTOCOL.INI by adding the following:

## CICS clients in Novell NetWare LANs

```
[NETBIOS]
  DriverName = NetBios$
  Bindings = IBMTOK_nif
  ADAPTER0 = IPXNB$,0
```

Remember, this example is for a token ring adapter.

An example of a PROTOCOL.INI file resulting from setting up NetBIOS emulation over IPX is shown in Figure 21 on page 135.

At this point you can restart the workstation.

```
REM --- NetWare Requester statements BEGIN ---
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE
REM -- Following statement added by LAPS
DEVICE=C:\IBMCOM\PROTOCOL\ODI2NDI.OS2

REM -- ODI-Driver Files BEGIN --
REM DEVICE=C:\NETWARE\TOKEN.SYS
DEVICE=C:\NETWARE\ROUTE.SYS
REM -- ODI-Driver Files END --

DEVICE=C:\NETWARE\IPX.SYS
rem DEVICE=C:\NETWARE\SPX.SYS
rem RUN=C:\NETWARE\SPDAEMON.EXE
rem DEVICE=C:\NETWARE\NMPIPE.SYS
rem DEVICE=C:\NETWARE\NPSEVER.SYS
rem RUN=C:\NETWARE\NPDAEMON.EXE
DEVICE=C:\NETWARE\NWREQ.SYS
IFS=C:\NETWARE\NWIFS.IFS
RUN=C:\NETWARE\NWDAEMON.EXE
DEVICE=C:\NETWARE\NETBIOS.SYS
RUN=C:\NETWARE\NBDAEMON.EXE
rem DEVICE=C:\NETWARE\VIPX.SYS
rem DEVICE=C:\NETWARE\VSHELL.SYS PRIVATE
REM --- NetWare Requester statements END ---
```

Figure 20. Statements added to CONFIG.SYS for NetWare Requester for OS/2 and LAPS



## CICS clients in Novell NetWare LANs

```
[PROT_MAN]

    DRIVERNAME = PROTMAN$

[IBMLXCFG]

    NETBEUI_nif = NETBEUI.NIF
    ODI2NDI_nif = ODI2NDI.NIF
    IBMTOK_nif = IBMTOK.nif

[NETBEUI_nif]

    DriverName = netbeui$
    Bindings = IBMTOK_nif
    ETHERAND_TYPE = "I"
    USEADDRREV = "YES"
    OS2TRACEMASK = 0x0
    SESSIONS = 210
    NCBS = 250
    NAMES = 40
    SELECTORS = 5
    USEMAXDATAGRAM = "NO"
    ADAPTRATE = 1000
    WINDOWERRORS = 0
    MAXDATARCV = 4168
    TI = 30600
    T1 = 500
    T2 = 200
    MAXIN = 1
    MAXOUT = 1
    NETBIOS_TIMEOUT = 500
    NETBIOSRETRIES = 8
    NAMECACHE = 0
    PIGGYBACKACKS = 1
    DATAGRAMPACKETS = 2
    PACKETS = 350
    LOOPPACKETS = 1
    PIPELINE = 5
    MAXTRANSMITS = 6
    MINTRANSMITS = 2
    DLCRETRIES = 5
    NETFLAGS = 0x0

[NETBIOS]

    DriverName = NetBios$
    Bindings = IBMTOK_nif
    ADAPTER0 = IPXNB$,0
```

Figure 21 (Part 1 of 2). Example of PROTOCOL.INI after setting up NetBIOS emulation

## CICS clients in Novell NetWare LANs

```
[ODI2NDI_nif]
  DriverName = odi2ndi$
  Bindings = IBMTOK_nif
  NETADDRESS = "10005a6ecddb"
  TOKEN-RING = "yes"
  TOKEN-RING_SNAP = "no"
  ETHERNET_802.3 = "no"
  ETHERNET_802.2 = "no"
  ETHERNET_II = "no"
  ETHERNET_SNAP = "no"
  TRACE = 0x0

[IBMTOK_nif]

  DriverName = IBMTOK$
  ADAPTER = "PRIMARY"
  MAXTRANSMITS = 6
  RECVBUFS = 2
  RECVBUFSIZE = 256
  XMITBUFS = 1
```

Figure 21 (Part 2 of 2). Example of PROTOCOL.INI after setting up NetBIOS emulation

### Setting up CICS Client for Windows

1. Install the NetWare DOS Requester code, ensuring that you select Windows support.
2. Install and configure NetWare NetBIOS emulation:
  - a. The file NETBIOS.EXE (the NetBIOS emulator program) should have been copied to your hard disk during installation of the NetWare client code. If not, locate the file on the NetWare disks and copy it.
  - b. In the file C:\NWCLIENT\STARTNET.BAT (see Figure 22 on page 137), add the line:  
NETBIOS  
  
*immediately before* the line:  
CD \
  - c. Restart the workstation to confirm that NetBIOS support will correctly load at startup.

## CICS clients in Novell NetWare LANs

```
@ECHO OFF
c:
CD \NWCLIENT
SET NWLANGUAGE=ENGLISH
LSL
TOKEN.COM
IPXODI
VLM
NETBIOS *** This line added manually ***
CD\
```

Figure 22. Example of a STARTNET.BAT file for DOS and Windows clients

## **CICS clients in Novell NetWare LANs**

## Renaming the client initialization and mapping files

---

### Chapter 5. Customization

**This chapter describes**

- “Renaming the client initialization and mapping files”
- “Preparing the client initialization file” on page 140
- “Customizing the keyboard” on page 155
- “Customizing the screen colors” on page 161
- “Testing the client/server link” on page 164

This chapter describes how to prepare the client initialization file, and also how you can customize the client keyboard mapping, screen colors, and attributes.

---

### Renaming the client initialization and mapping files

The following files are supplied with CICS clients in the \CICSCLI\BIN directory by default:

<b>CICSCLI.INI</b>	The client initialization file
<b>CICSKEY.INI</b>	The keyboard mapping file
<b>CICSCOL.INI</b>	The color mapping file

It is recommended that you create your own customized versions of these files with different names, because installation of service updates may overwrite the files and cause any customization to be lost.

You should reference your customized files through the following environment variables:

<b>File</b>	<b>Environment variable</b>
<b>client initialization file</b>	CICSCLI
<b>keyboard mapping file</b>	CICSKEY
<b>color mapping file</b>	CICSCOL

You can set these environment variables in the AUTOEXEC.BAT (DOS and Windows), CONFIG.SYS (OS/2) file, or via the **System** icon in the Windows NT control panel, for example:

```
SET CICSCLI = C:\CUSTOM\MYCLI.INI
```

**Note:** For CICS Client for Macintosh, the preferences file is used instead of environment variables. You are strongly recommended to keep a backup copy of this preferences file.

## Preparing the client initialization file

---

### Preparing the client initialization file

The initialization file contains configuration information used to inform the client of the servers it can connect to and the necessary communication protocols. A sample initialization file is supplied for each IBM CICS Client product.

The default filename for the initialization file is CICSCLI.INI (in the \CICSCL\BIN directory by default), but this can be overridden for all CICS clients (apart from CICS Client for Macintosh) by the environment variable CICSCLI, which specifies the name of the initialization file to use. You can also specify which file to use with the /f parameter of the CICSCLI command (see “Specifying which client initialization file to use” on page 177).

**Note:** For CICS Client for Macintosh, a preferences file is provided within which the initialization file is identified. You can change the preferences file using the CICS Client for Macintosh Administration Utility. The CICSCLI.INI file supplied for CICS Client for Macintosh does not contain parameters concerned with NetBIOS communication.

### Client initialization file syntax

You create or edit the initialization file with a text editor according to the following syntax rules:

1. Parameters are entered on individual lines, and cannot be continued over more than one line:  
`parameter=value`
2. Any line where the first nonblank character is either a semicolon (;) or a hash (#) is treated as a comment.
3. Blank characters before the parameter keyword, and either side of the = (equals) character, are ignored.
4. The parameter value is taken as the first nonblank character following the = (equals) character up to the last nonblank character on the line. However, if the equals is followed by # or ; preceded by one or more blanks, the parameter value continues up to the last nonblank character before the string of blanks. (Unless the # or ; is the first character of the parameter value.)

To illustrate:

```
# this is a comment line
Server = CICSESA      # here is a comment
Netname = #cicse     # the first hash is part of the value
```

5. Parameter values must not contain embedded blanks.
6. The parameter keyword is not case-sensitive; however, the values themselves may be. (The parameter descriptions in “Client initialization file parameters” on page 144 indicate which values are case-sensitive.)

## Preparing the client initialization file

### Client initialization file structure

The initialization file is structured into sections, each containing a set of parameters specific to that section:

1. At most one *Client* section.
2. One or more *Server* sections. The first server definition is used as the default server for the client.
3. One or more *Driver* sections. You must create one Driver section for each unique protocol referenced in the Server sections.

The Client section should precede the Server sections, and the Server sections should precede the Driver sections.

**Note:** Use of a section-specific parameter within another section generates an error. Parameters that are operating-system specific, for example, `DosMemory` which is applicable only to CICS Client for DOS, are ignored on other platforms.

**You can change the client initialization file at any time, but you must stop and then restart the client before the changes take effect.** See Chapter 6, “Operation” on page 165 for details of how to stop and start the client.

## Preparing the client initialization file

The full syntax for the initialization file is shown in Figure 23 on page 143. Items bracketed with [ and ] are optional. Values separated by | indicate that one item from the list should be selected.



## Preparing the client initialization file

```
[Client=* | applid
  [MaxBufferSize=nn]
  [TerminalExit=name]
  [TraceFile=filename]
  [LogFile=filename]
  [ApiTrace=Y|N]
  [MaxServers=nnn]
  [MaxRequests=nnnnn]
  [DosMemory=nnn]
  [PrintCommand=command]
  [PrintFile=filename]
  [DumpMemSize=nn]
  [DumpFile=filename]
  [CPName=name]
  [CPIAddressMask=mask]
  [DomainNameSuffix=suffix]
  [DceCellDirectory=Y|N]
  [EnablePopups=Y|N]
]
Server=Servername
  NetName=Applid | LUName | HostName | IPAddress
  Protocol=ProtocolName
  [Description=desc]
  [UpperCaseSecurity=Y|N]
  [InitialTransid=transid]
  [ModelTerm=name]
  [Port=nnnn]
  [Adaptor=0|1|2|3]
  [LocalLUName=LUName]
  [Modename=modename]
  [LUAliasNames=Y|N]
  [AppleGateway=name]
  [AppleZone=zone]
  [SnaLocalLUAddr=nnn]
  [SnaSessionLimit=nnn]
  [SnaDLCName=name]
  [SnaPLUAdapterAddr=address]
  [SnaMaxRUSize=nnnn]
  [SnaPacingSize=nn]
  [SnaRetryCount=nnn]
  [LUIPAddressmask=suffix]
  [EndPoint=portnumber]
  [TcpKeepAlive=Y|N]

Driver=ProtocolName
  Drivername=drivername
```

Figure 23. Client initialization file syntax

## Preparing the client initialization file

### Client initialization file parameters

You will find it useful to refer to the following list when working through the definition checklists in Chapter 4, "Setting up client/server communication" on page 69.

**Client** This parameter introduces the section of the initialization file defining aspects of the client itself. If this parameter (and hence section) is omitted, default values are used.

**applid** Up to 8 characters. The default is \*.

This value specifies the applid of the CICS client workstation in the form in which it will be autoinstalled as a system at the CICS server. The name must be unique within the CICS server system. The value of \* can be used to automatically generate a name that is guaranteed to be unique.

**Note:** If the client is autoinstalled to more than one CICS server, and if **applid** specifies a specific name, that name must be unique with respect to all servers it is connected to. If the name is not unique, then attempts to connect to a server may be rejected because another client has already been installed using the same name. If a name of \* is used, the client may be known by a different unique name at each server.

If the client is to communicate with a given server via APPC, then this applid may be overridden at the time the client is installed at the server by the LUName for the client as defined in the Server definition.

#### **MaxBufferSize**

A number of kilobytes, in the range 4 through 32. The default is 32 KB.

This value specifies the size of the transmission buffers in which application or terminal data will flow. The value should be large enough to cater for the largest possible COMMAREA or terminal input/output area (TIOA) to be used. The value does *not* include an overhead of 512 bytes needed by the clients for some protocols.

This parameter need normally be set only for clients running in a memory-constrained environment.

**Note:** For CICS Client for Windows running on an Intel 80286 microprocessor, or on a later microprocessor in standard mode, and communicating over NetBIOS, MaxBufferSize must normally be set to 4, otherwise the client will not start. However, if it is necessary to send and receive large COMMAREA data blocks, a larger value for MaxBufferSize must be set. To allow this, set the NetHeapSize parameter in the [Standard] or [386Enh] stanza in the Windows SYSTEM.INI file as appropriate for your system. For example:

## Preparing the client initialization file

[Standard]  
NetHeapSize=48

A NetHeapSize value of 48 should allow a maximum MaxBufferSize of 32 for a Windows client in standard mode. For enhanced mode, Windows usually suggests an appropriate value to use the first time the CICS client is run.

### TerminalExit

A 1- to 4-character string; the default is EXIT.

The string, when entered at a terminal emulator at any time and place where a transaction name can be entered, causes the terminal emulator to terminate. The string must not contain any blank characters.

The string is case-sensitive. If a terminal emulator has uppercase translation in its CICS terminal definition, this string should be specified in uppercase.

**TraceFile** The name of the trace file to be used for problem diagnosis. If not specified, it defaults to CICSCLI.TRC in the \CICSCLI\BIN directory.

**LogFile** The name of the log file to be used for problem diagnosis. If not specified, it defaults to CICSCLI.LOG in the \CICSCLI\BIN directory.

**ApiTrace** The character Y or N. The default is N. If set to Y and client tracing is active, extra EPI and ECI related trace points are issued.

**Note:** This tracing function is not available for CICS Client for DOS or CICS Client for Macintosh.

### MaxServers

A value in the range 1 through 256. The default is 1.

This value specifies the maximum number of servers that can be accessed concurrently from the client.

For more information on the use of MaxServers, see "NetBIOS resources" on page 74.

### MaxRequests

A value in the range 1 through 10 000. The default is 20. This value specifies the maximum number of concurrent items that may be executing on the client, when an item is defined as a terminal emulator, an EPI terminal or an ECI unit of work.

This value is used to detect runaway situations where an application could, in error, submit an excessive number of requests to a server. The actual limit may be less than this parameter if other operating system limits (for example, memory constraint or communication sessions), come into effect.

## Preparing the client initialization file

### DosMemory

**Required for CICS Client for DOS only.** A value in kilobytes in the range 8 through 500. The default is 48 KB.

Defines the amount of memory to be reserved for the CICS Client for DOS terminate and stay resident (TSR) program.

The value must be greater than (MaxBufferSize + 4). A value of 48 permits a MaxRequests limit of at least 16. Specifying a larger value increases the maximum number of concurrent activities.

If the trace to memory function is to be used, the DosMemory value should be increased by (32 + DumpMemSize value).

### PrintCommand

A character string, from 1- to 256-characters long.

The specified string is a command specific to the operating system under which the client is running. When a request to print is received at the client, the client generates a temporary print file with a unique name per print request.

The parameter string is appended with the temporary file name, and the resultant command executed. This allows, for example, print requests to be copied to a file, directed to a local printer, formatted for inclusion into documentation, and so on.

A command file may be necessary to act as an interface between the syntax of the invocation command defined here, and more general operating system syntax. For example, if the desired final command was COPY printfile LPT2, a simple command file would be required to reorder the parameters. It is the responsibility of the PrintCommand to delete the temporary print file after it has finished processing it.

See also the **PrintFile** description for more information.

**Note:** This parameter is ignored for CICS Client for Macintosh.

### PrintFile

A character string, 1 to 256 characters long.

This option is applicable only if the PrintCommand option is omitted.

The specified string identifies a file to which output from print requests received at the client is directed. Each print request is appended to the end of the current file.

If both this value and PrintCommand are omitted, the default action for CICS Client for DOS, CICS Client for OS/2, and CICS Client for Windows Family is to direct the print data to LPT1.

## Preparing the client initialization file

**Note:** For CICS Client for Macintosh the default is to direct the output to the default printer.

**Note:** This initialization file setting acts only as a default. The terminal and print emulators provide options to override this value (see “CICSTERM command reference” on page 187 and “CICSPRNT command reference” on page 192).

### DumpMemSize

A number of kilobytes, in the range 1 through 32. The default is 16 KB. For CICS Client for DOS, a small value is recommended.

This value specifies the size of the internal buffer to which trace records are written by the CICS clients trace to memory function. This internal buffer is dumped to a file using the CICSCLI /z command, and also if CICS Client for OS/2 terminates abnormally. The buffer wraps, so it is the most recent trace records that are available.

For more information on the trace to memory function, see “CICS clients trace” on page 220.

**DumpFile** The name of the file to be used for the CICS clients trace to memory function. If not specified, it defaults to CICSCLI.DMP in the \CICSCLI\BIN directory.

The following parameters are required for communication over TCP62:

**CPName** The fully-qualified CP name, or a template for the fully-qualified CP name, of the node to be started. If there are no template replacement characters (\*), it is a real name, otherwise it is a template and is used together with the **CPIPAddressMask** parameter to dynamically generate a CP name. The net ID must not contain any template replacement characters.

Dynamic Name generation for the CP name and the Local LU name means that the same CICS client initialization file can be used on all client machines and different names are generated based on the IP address of the client machine.

Names are dynamically generated from a “template” and a “key”. The key is formed by the logical AND of an IP address with the logical NOT of the mask, that is:

$$\text{key} = \text{ip\_address} \ \& \ !\text{ip\_address\_mask}$$

For example, if ip\_address is X'09'.X'25'.X'50'.X'9E' (9.37.80.158) and ip\_address\_mask is X'FF'.X'FF'.X'80'.X'80', then key is X'00'.X'00'.X'50'.X'1E'. The mask selects which bits from the IP address are used in the name generation. To exclude some IP address bits from the name generation, the corresponding mask bits are set to 1.

## Preparing the client initialization file

### **CPIPAddressMask**

The IP address mask to be used in dynamic CP name generation, in big-endian, that is, most significant byte first order. This parameter is ignored if **CPName** is not a template. The default is all 0 characters.

### **DomainNameSuffix**

The AnyNet domain name suffix. This parameter is used with the partner LU name (**NetName**) to determine the IP address of the host associated with that LU. For example, if the domain name suffix is `sna.ibm.com` and the partner LU name is `NETID.LUA` a `GetHostByName` call is issued for hostname `LUA.NETID.sna.ibm.com` to obtain the IP address of the node that has the LU name `NETID.LUA`.

The default is `sna.ibm.com`.

### **DceCellDirectory**

The character Y or N. If this parameter is set to **Y**, the CDS services are used, provided DCE is installed and configured on the client machine. If set to **N**, CDS is not used. If omitted, this setting defaults to **Y**, if DCE is installed on the client machine, and to **N** if DCE is not installed. Thus, existing CICS client installations need no configuration changes to make use of the CDS.

This option is provided because searching the CDS for CICS servers may take some time, particularly with a large DCE cell. You can disable this search yet still have DCE installed on your client systems and still use DCE RPC to communicate with CICS servers.

### **EnablePopups**

The character Y or N. If this parameter is set to **Y**, the display of popup messages is enabled at startup. If set to **N**, the display of popups is disabled. You can also change this setting dynamically by using the `CICSCLI /n` and `CICSCLI /e` commands.

**Server** A separate definition must be included for each server to which the client needs to connect.

### **Servername**

A 1- to 8-byte character string providing a communications-protocol-independent name for the server local to the client. Requests to access the server from ECI, EPI, or terminal emulators reference the server through this name.

**NetName** A character string, the length and format of which depend on the communications protocol to the server. The string provides the client with the identification of the server as it is known to the communications protocol.

## Preparing the client initialization file

The string is case-sensitive.

For NetBIOS, *Applid* specifies the NetBIOS name of the server, and for CICS for OS/2 and CICS for Windows NT (Version 2 only), this is specified in the Local System Appl ID field in the system initialization table (SIT).

For APPC, and for TCP62 *LUName* specifies the LUName of the server as it is known to the APPC configuration at the client. This must be a qualified 17-character name, for example, ABC3XYZ4.PQRS1234. For Client Access/400, if you want to use the default remote system specified by the RTDN identifier in the Client Access/400 configuration file, then specify \* for NetName. For SNA•ps, NetName must reference the APPC Remote LU Name in the SNA•ps configuration file.

For TCP/IP, *HostName* or *IPAddress* specify the character or numeric TCP/IP identifier for the host on which the server is running. For example, cicssrv2.company.com (HostName) or 9.20.4.1 (IPAddress). Hostnames are mapped to IP addresses either by the name server or in a HOSTS file. It is, however, better to use a Hostname in case the IP address changes.

**Protocol** A 1- to 8-character string identifying the communication protocol to be used to communicate between the client and the server. This parameter is mandatory, and must match the **ProtocolName** parameter in the Driver section.

There are no predefined values for the protocol name. You must provide a Driver parameter group for each communication protocol referenced, mapping the protocol name to the interface code provided with the client.

### Description

An optional 1- to 60-character string offering a description for the server. This description is returned to applications running on the client via the CICS\_EpiListSystems and CICS\_EciListSystems functions (see the *CICS Family: Client/Server Programming* book).

### UpperCaseSecurity

Y or N. If set to Y, any userid or password from an ECI application or resulting from a user prompt is converted to uppercase. See "Setting up security" on page 178 for more information.

### InitialTransid

A 1- to 128-character string.

This string identifies the initial transaction (and any parameters) to be run when the terminal emulator connects to the server. If this option is omitted, no initial transaction is run. The first four characters, or the characters up to the first blank

## Preparing the client initialization file

in the string are taken as the transaction. The remaining data is passed to the transaction on its invocation.

The string is case-sensitive.

### **ModelTerm**

A 1- to 16-character string. The default is \*.

The string is case-sensitive and specifies the name of a model terminal definition at the server, identifying the characteristics of terminals to be autoinstalled from the client. If the model cannot be located at the server, or this parameter is not specified, a default terminal definition is used. This default is server-specific.

The interpretation of the ModelTerm value is server-specific. For example, for a CICS for OS/2 server, the value is validated (by the server) as a 1- to 4-character string identifying a model entry in the CICS terminal definition control tables with a terminal name set to the value specified on this parameter. For a CICS for AIX server, the value is 1 to 16 characters, and is the DevType for a CICS terminal definition entry to be used as the model.

### **Port**

**Required for TCP/IP communication only.** A numeric value in the range 0 through 65535 defining the port number at the server to which the client should connect. If this parameter is omitted, a default value of 0 is assumed. A value of 0 indicates that the SERVICES file in the TCP/IP \ETC directory should be used to locate the port number for the service CICS using a protocol of TCP.

If no entry can be located in the SERVICES file, a value of 1435 is assumed, this being the TCP/IP architecture assigned port for CICS clients.

**Note:** For CICS Client for Macintosh, no reference is made to a SERVICES file. If a value of 0 is entered, 1435 is assumed.

### **Adapter**

**Required for NetBIOS communication only.** A numeric value in the range 0 through 3 specifying which LAN adapter the client should use. The default is 0.

### **LocalLUName**

**Required for APPC communication only.** The name of a local LU to be used when connecting to the server. The same LU can be used for all server connections. The same LU can be used for all server connections, except where NetWare for SAA is being used with CICS Client for DOS or CICS Client for Windows, in which case each client-server link must use a different local LU.

**For TCP62 communication,** this is the real LU name or a template for the LU name of a local LU to be used when



## Preparing the client initialization file

connecting to the server. If there are no template replacement characters (\*), it is a real name, otherwise it is a template and is used together with the **LUIPAddressMask** parameter to dynamically generate an LU name (refer to the description of the CPName parameter on page 147). Note that CICS for MVS/ESA uses the last four characters of the LUName as the connection name, so these characters must be unique.

**Note:** For CICS Client for Macintosh you can obtain this from your SNA•ps gateway administrator. While it is possible for several CICS Client for Macintosh systems to use the same LocalLUName at the same time (all concentrated through a common SNA•ps Gateway machine) this is not recommended, as incoming Allocates may be routed to the wrong client. Unless all you are using under the client is ECI applications, you should define multiple Local LUs in your SNA•ps configuration file and use a different one in each CICS Client for Macintosh connected through the Gateway.

### ModeName

**Required for APPC communication only.** A 1- to 8-character string specifying the mode name to be used when connecting to the server. For Client Access/400 APPC communications, this value can be omitted, because the fixed mode name of QPCSUPP required by Client Access/400 is used. For other APPC communication, omitting this parameter results in a blank mode name.

A value of \* can be specified if a blank mode name is required.

**For TCP62 communication,** if ModeName is not specified, a default mode name of TCP62 is used. You can use the **SnaSessionLimit**, **SnaMaxRUSize**, and **SnaPacingSize** parameters to define the mode specified by Modename. If you specify a mode that is already specified in the Personal Communications configuration file, the mode is not redefined. If the same mode is specified on two different TCP62 server connections, the mode definition is taken from the first server to be connected.

### LUAliasNames

Y or N. In SNA server definitions that use the CCLWNTSN.DLL protocol driver, or for CICS Client for OS/2 using the CCLIBMSN.DLL driver, setting this parameter to Y enables the NetName and LocalLUName to be specified as alias names instead of real LU names. The default is N.

**Note:** This parameter does not apply to CICS Client for DOS or CICS Client for Macintosh.

## Preparing the client initialization file

### AppleGateWay

**Required for CICS Client for Macintosh communicating via SNA•ps.** A 1- to 32-character string specifying the name of the SNA•ps gateway. For CICS Client for Macintosh you can obtain this from your SNA•ps gateway administrator.

### AppleZone

**Required for CICS Client for Macintosh communicating via SNA•ps.** A 1- to 32-character string identifying the zone for the SNA•ps gateway. A value of \* indicates that the local zone is to be used. If this parameter is omitted, a default of \* is used.

**The following seven parameters are required for APPC communication using NetWare for SAA (but are not applicable for Windows NT or Windows 95 NetWare for SAA server definitions).**

### SnaLocalLUAddr

A 2-character string specifying the logical session number for the local LU. The value is specified as a pair of hexadecimal characters, for example, X'01' or X'FE'. If omitted, a default of X'00' is used. See the appropriate *NetWare Configuration Guide* for full details.

### SnaSessionLimit

A value in the range 1 through 255, specifying the maximum number of concurrently active sessions that will be permitted between the client and the partner LU. If not specified, the parameter defaults to 8. See the appropriate *NetWare Configuration Guide* for full details.

**Note:** You can also use this parameter for TCP62 to define the number of logical SNA sessions.

### SnaDLCName

One of ITRN, SDLC, QLLC or CUSTOM, which is the data link control identification needed for communication with the remote LU. If not specified, the default is ITRN (used for a Token Ring link). See the appropriate *NetWare Configuration Guide* for full details.

### SnaPLUAdapterAddr

A 1- to 12-character string identifying the PLU adapter address (the network adapter address of the partner LU). If not specified, the parameter defaults to a null string. See the appropriate *NetWare Configuration Guide* for full details.

### SnaMaxRUSize

A value in the range 256 through 4096, specifying the maximum request unit (RU) size to be used. If not specified, this parameter defaults to 1024. See the appropriate *NetWare Configuration Guide* for full details.

## Preparing the client initialization file

**Note:** You can also use this parameter for TCP62 to define the mode specified by the **ModeName** parameter.

### **SnaPacingSize**

A value in the range 0 through 63, specifying the maximum number of SNA messages that the local LU can receive without sending a pacing response. If not specified, this parameter defaults to 8. See the appropriate *NetWare Configuration Guide* for full details.

**Note:** You can also use this parameter for TCP62 to define the mode specified by the **ModeName** parameter.

### **SnaRetryCount**

A value in the range 1 through 100, specifying the maximum number of retry attempts for the CICS Client when allocating a conversation to, or receiving data from, the CICS server. If not specified, this parameter defaults to 10. See the appropriate *NetWare Configuration Guide* for full details.

The following parameter may be required for communication over TCP62:

### **LUIPAddressMask**

The IP address mask to be used in dynamic LU name generation, in big-endian, that is, most significant byte first order. This parameter is ignored if **LocalLUName** is not a template. The default is all 0 characters.

**EndPoint** A port number. This is an optional parameter and is only used if the Netname specifies a TCP/IP address rather than a CICS region name. If present, and set to a non-zero value, it gives the TCP/IP port number associated with the CICS server's RPC end-point. If omitted or set to zero, the RPC endpoint mapper is used to automatically generate an appropriate end-point.

The EndPoint parameter is not normally required. However, if several CICS regions are running on the same machine, and therefore have the same TCP/IP address, this parameter is needed to distinguish between the CICS regions.

### **TcpKeepAlive**

Y (the default) or N. If set to Y, TCP/IP periodically sends KeepAlive packets to the server to check the connection.

**Driver** This parameter introduces a section of the initialization file defining the protocol drivers required to communicate with the servers.

### **ProtocolName**

A 1- to 8-character string. For each protocol referenced from the Server sections, you must provide a Driver section with ProtocolName matching the name of the protocol as specified in the Server section.

## Preparing the client initialization file

### Drivername

A 1- to 8-character string, naming the device driver to be loaded to enable the client to communicate with the server:

Client	Driver	Protocol and product
DOS, OS/2, Windows 3.x	CCLIBMNB	NetBIOS for OS/2, Windows, and DOS
Windows 95 and Windows NT	CCLWNTNB	NetBIOS for Windows 95 and Windows NT
DOS, OS/2	CCLBMIP	IBM TCP/IP for OS/2 and DOS
DOS, OS/2	CCLFTPIP	FTP TCP/IP for OS/2 and DOS
DOS, OS/2	CCLNOVIP	Novell LAN Workplace TCP/IP for OS/2 and DOS
Windows 3.x	CCLWINIP	Windows TCP/IP, as provided by any vendor offering a WINSOCK interface (including IBM, FTP, and Novell)
Windows 95 and Windows NT	CCLWNTIP	TCP/IP for Windows 95 and Windows NT
Macintosh	CCLMACIP	MacTCP
Windows 3.x	CCLIBMSN	IBM APPC Networking Services for Windows APPC
OS/2	CCLIBMSN	IBM OS/2 Communications Manager/2 APPC
DOS,	CCL400SN	IBM Client Access/400 APPC for DOS
Windows 3.x	CCLIBMSN	IBM Client Access/400 APPC for Windows
DOS, Windows 3.x	CCLNOVSN	Novell NetWare for SAA APPC
Macintosh	CCLMACSN	APPC using SNA•ps.
Windows 3.x, Windows 95 and Windows NT	CCLWNTSN	APPC using Microsoft SNA Server, IBM Communications Server or IBM Personal Communications.
Windows 95 and Windows NT	CCLWNTSN	Novell NetWare for SAA APPC
Windows NT	CCLBMRP	RPC using IBM, Digital, or Transarc DCE
Windows NT	CCLGRARP	RPC using Gradient PC-DCE
OS/2	CCLTCP62	TCP62 using Communications Server
Windows 95 and Windows NT	CCLTCP62	TCP62 using IBM Personal Communications.

## Customizing the keyboard

### Customizing the keyboard

The keyboard mapping for emulator operation is defined in a keyboard mapping file. The file supplied is CICSKEY.INI in the \CICSCLI\BIN directory by default. It is however, recommended that you create your own customized mapping file.

The keyboard mapping file can be identified by:

- The /k option of the CICSTERM command, which identifies a keyboard mapping file with a particular terminal (see page colorfile parameter on page 187).
- The CICSKEY environment variable in CICS Client for DOS, CICS Client for OS/2 and CICS Client for Windows. For example:

```
SET CICSKEY = C:\CUSTOM\MYKEYS.INI
```

You can set this environment variable in the CONFIG.SYS (CICS Client for OS/2), AUTOEXEC.BAT file (CICS Client for DOS and CICS Client for Windows) or via the **System** icon in the Windows NT control panel.

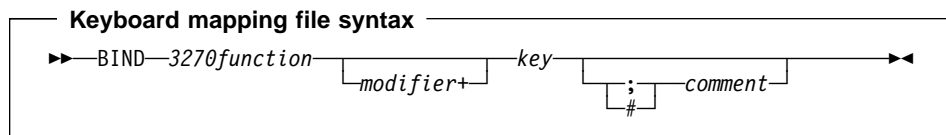
If neither of these is specified, a filename of CICSKEY.INI in the current directory is assumed.

**Note:** For CICS Client for Macintosh you can identify the keyboard mapping file by creating an appropriate options file for the CICSTERM command (see "Options files for CICSTERM" on page 186).

You can change the keyboard mapping file at any time, although changes do not take effect until the next time the terminal emulator is started.

### Keyboard mapping file syntax

This section describes the syntax of the keyboard mapping file. A statement must be provided for each key that is needed, because there are no default assignments (except for the alphabetic and numeric keys). There is no case sensitivity, so keywords and values may be entered in uppercase, lowercase or mixed case. Each binding must be on a separate line, and of the following form:



For example, to map the 3270 function EraseEof to the Ctrl+Delete keys pressed together the binding would be as follows:

```
bind EraseEof Ctrl+Delete ;erase to end of field
```

## Customizing the keyboard

### The keyboard mapping file

In the mapping file, *3270function* can be any one of the following:

backspace	pa1	pf1	pf13
backtab	pa2	pf2	pf14
clear	pa3	pf3	pf15
cursor <sub>down</sub>		pf4	pf16
cursor <sub>left</sub>	printscreen	pf5	pf17
cursor <sub>right</sub>	reset	pf6	pf18
cursor <sub>select</sub>	tab	pf7	pf19
cursor <sub>up</sub>		pf8	pf20
delete	ignore	pf9	pf21
enter		pf10	pf22
erase <sub>eof</sub>		pf11	pf23
erase <sub>input</sub>		pf12	pf24
home			
insert			
newline			

The value of IGNORE is provided to permit unwanted control keys on the keyboard to be ignored. (Unexpected glyphs are not generated.)

The *Modifier* can be any one of:

Alt	(IBM keyboards only)
Ctrl	
Shift	

The *Key* can be any one of the keys shown in Table 25 on page 157, but some combinations of modifier+key are not supported:

## Customizing the keyboard

<i>Table 25. CICS client keys that can be mapped</i>	
Group	Keys
Escape key	Escape
Function keys	f1 f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12
Numeric keys	0 1 2 3 4 5 6 7 8 9
Alphabetic keys	a b c d e f g h i j k l m n o p q r s t u v w x y z
Tab key	Tab
Movement keys	newline backspace insert home pageup delete end pagedown up left down right
Keypad keys	keypad/ keypad* keypad- keypad7 keypad8 keypad9 keypad4 keypad5 keypad6 keypad+ keypad1 keypad2 keypad3 keypad0 keypad. keypadenter

In addition, the following key mappings are allowed for CICS Client for Windows, CICS Client for Windows NT, and CICS Client for Windows 95:

```
bind Clear          Pause
bind Reset          Scroll Lock
```

### Keys specific to particular keyboards

Some keys are specific to particular types of keyboard.

#### For CICS Client for Macintosh users:

**Function keys** Function keys are available only on the Apple Macintosh extended keyboard.

**Movement keys** insert, home, pageup, end, pagedown, delete are available only on the Apple Macintosh extended keyboard.

**Apple extras** f13, f14, f15 are available only on the Apple Macintosh extended keyboard.

The following additional keys are unique to Apple Macintosh keyboards:

```
§ ` f13 f14 f15 keypad=
```

The following additional key is unique to IBM keyboards:

```
rightctrl
```

## Customizing the keyboard

### Key combinations

The following combinations of modifier and key can be mapped:

<b>No modifier</b>	All keys available for mapping.
<b>Alt modifier</b>	Only function keys, numeric keys, movement keys, and alphabetic keys can be mapped.
<b>Ctrl modifier</b>	Only function keys, movement keys, alphabetic keys, tab key, and keypad keys can be mapped.
<b>Shift modifier</b>	Only function keys, numeric keys, tab key, and alphabetic keys can be mapped.

**Note:** For CICS Client for Windows, all modifier and key combinations that are not preempted by Windows can be mapped.

A sample key mapping file is shown in Figure 24 on page 159.



## Customizing the keyboard

```
;*****  
;* IBM CICS Client - 3270 Emulator Keyboard Binding File *  
;*****  
  
; Format:  
; bind 3270_key [modifier+]workstation_key  
;  
; Refer to the "IBM CICS Clients Administration" book for full details  
; of available values.  
  
; Note: There are no default key bindings, ensure all required 3270  
; keys are mapped. "Enter" and "Clear" are particularly  
; important.  
  
; Miscellaneous keys  
bind Enter      RightCtrl  
bind Enter      KeypadEnter  
bind Enter      Ctrl+KeypadEnter  
bind Clear      Escape  
bind Reset      Alt+R  
bind Newline    Newline  
bind Tab        Tab  
bind Backtab    Shift+Tab  
bind Backspace  Backspace  
bind Delete     Delete  
bind Delete     Keypad.  
bind Insert     Insert  
bind Insert     Keypad0  
bind EraseEof   Ctrl+Delete  
bind EraseInput Alt+End  
bind Ignore     End  
bind PrintScreen Alt+P  
  
; Cursor movement  
bind CursorUp   Up  
bind CursorUp   Keypad8  
bind CursorDown Down  
bind CursorDown Keypad2  
bind CursorLeft Left  
bind CursorLeft Keypad4  
bind CursorRight Right  
bind CursorRight Keypad6  
bind CursorSelect Alt+F3  
bind Home       Home  
bind Home       Keypad7
```

Figure 24 (Part 1 of 2). Sample keyboard mapping file for CICS clients

## Customizing the keyboard

```
; PF and PA keys
bind Pf1      F1
bind Pf2      F2
bind Pf3      F3
bind Pf4      F4
bind Pf5      F5
bind Pf6      F6
bind Pf7      F7
bind Pf7      Keypad9
bind Pf7      PageUp
bind Pf8      F8
bind Pf8      Keypad3
bind Pf8      PageDown
bind Pf9      F9
bind Pf10     F10
bind Pf11     F11
bind Pf12     F12
bind Pf13     Shift+F1
bind Pf14     Shift+F2
bind Pf15     Shift+F3
bind Pf16     Shift+F4
bind Pf17     Shift+F5
bind Pf18     Shift+F6
bind Pf19     Shift+F7
bind Pf20     Shift+F8
bind Pf21     Shift+F9
bind Pf22     Shift+F10
bind Pf23     Shift+F11
bind Pf24     Shift+F12
bind Pa1      Alt+Insert
bind Pa2      Alt+Home
bind Pa3      Alt+PageUp

;*****
;* End of file                                     *
;*****
```

Figure 24 (Part 2 of 2). Sample keyboard mapping file for CICS clients

## Customizing the screen colors

---

### Customizing the screen colors

The screen colors and attributes are defined in a color mapping file. A sample is provided for you to tailor. The file supplied is CICSCOL.INI in the \CICSLIBIN directory by default. It is recommended that you create your own customized mapping file.

The color mapping file can be identified by:

- The /c option of the CICSTERM command, which identifies a color mapping file with a particular server (see page colorfile parameter on page 187).
- The CICSCOL environment variable, in CICS Client for DOS, CICS Client for OS/2, and CICS Client for Windows. For example:

```
SET CICSCOL = C:\CUSTOM\MYCOLS.INI
```

You can set this environment variable in the CONFIG.SYS (CICS Client for OS/2) or AUTOEXEC.BAT file (CICS Client for DOS and CICS Client for Windows) or via the **System** icon in the Windows NT control panel.

If neither of these is specified, a filename of CICSCOL.INI in the current directory is assumed.

**Note:** For CICS Client for Macintosh you can identify the color mapping file by creating an appropriate options file for the CICSTERM command (see “Options files for CICSTERM” on page 186).

A color mapping file is used to provide alternative representations in hardware environments where it is not possible to exactly replicate 3270 screen attributes, for example, blinking or underscore. The color mapping file therefore defines how 3270 screen attributes are emulated on the client hardware.

The color mapping file is optional. However, for most hardware environments a mapping file is required if blinking or underscore support is required by the emulator.

#### Notes:

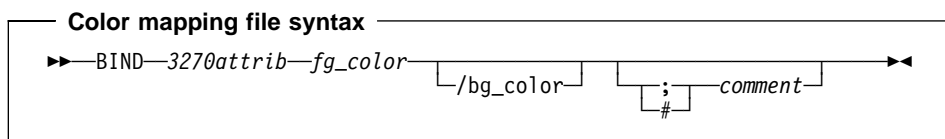
1. If the color mapping file specifies a mapping for an attribute, this mapping is used even if the hardware upon which the client is running actually supports the screen attribute.
2. If an application requests a 3270 field to be displayed with, for example, underscore, and no emulation setting has been specified, and the hardware cannot display underscore, then the field is displayed without any highlighting at all.

You can change the color mapping file at any time, although changes do not take effect until the next time the terminal emulator is started.

## Customizing the screen colors

### Color mapping syntax

The syntax of the color mapping file is as follows. There is no case sensitivity—keywords and values may be entered in uppercase, lowercase or mixed case. Each binding must be on a separate line, and of the form:



### The color mapping file

In the color mapping file, *3270attrib* can be any one of the following:

```
normal_protected    intensified_protected  
normal_unprotected  intensified_unprotected  
  
default    blinking_default    underscored_default  
blue       blinking_blue       underscored_blue  
green      blinking_green      underscored_green  
cyan       blinking_cyan        underscored_cyan  
red        blinking_red         underscored_red  
magenta    blinking_magenta     underscored_magenta  
white      blinking_white       underscored_white  
yellow     blinking_yellow      underscored_yellow  
  
default_highlight  
  
operator_information_area
```

Each of *fg\_color* and *bg\_color* (foreground color and background color) can be any one of the following:

```
black    light_gray  
blue     light_blue  
brown    yellow  
cyan     light_cyan  
green    light_green  
magenta  light_magenta  
red      light_red  
gray     white
```

If *bg\_color* is omitted, a default value of black is taken.

The sample color mapping file is shown in Figure 25 on page 163.

## Customizing the screen colors

```
*****
;* IBM CICS Client - 3270 Emulator Color Binding File *
*****

; Format:
; bind 3270_field foreground_color/background_color
;
; Refer to the "IBM CICS Clients Administration" book for full details
; of available values.

; Operation information area at the bottom of the screen.
bind operator_information_area black/green

; Color used as default for a terminal defined as monochrome, or to display
; characters displayed in the default color when character or field
; attributes are used
bind default light_green/black

; Color used for an intense field when either the terminal is defined as
; monochrome, or the screen has been formatted with extended attributes but
; the data to be displayed has default color and highlight.
bind default_highlight white/black

; Colors used for datastream formatted with field attributes when no
; extended character or field attributes are in use
bind normal_unprotected light_green/black
bind intensified_unprotected light_red/black
bind normal_protected light_cyan/black
bind intensified_protected white/black

; Colors used for datastream formatted with extended field attributes
; or datastream formatted with character attributes.
bind red light_red/black
bind green light_green/black
bind blue light_cyan/black
bind magenta light_magenta/black
bind cyan light_cyan/black
bind yellow yellow/black
bind white white/black

; The following bindings provide a mapping for 3270 blink and under-
; score attributes, as most workstation displays do not provide blink
; or underscore capabilities. For those that do these bindings could
; be deleted.
bind blinking_default light_green/gray
bind blinking_red light_red/gray
bind blinking_green light_green/gray
bind blinking_blue light_cyan/gray
bind blinking_magenta light_magenta/gray
bind blinking_cyan light_cyan/gray
bind blinking_yellow yellow/gray
bind blinking_white white/gray

bind underscored_default light_green/light_gray
bind underscored_red light_red/light_gray
bind underscored_green light_green/light_gray
bind underscored_blue light_cyan/light_gray
bind underscored_magenta light_magenta/light_gray
bind underscored_cyan light_cyan/light_gray
bind underscored_yellow yellow/light_gray
bind underscored_white white/light_gray

;* End of file *
```

Figure 25. Sample color mapping file

## Testing the client/server link

---

### Testing the client/server link

After you have prepared the client initialization file, and customized the keyboard and screen color attributes, you can test the client/server link.

1. Start the CICS server in the normal manner, as described in the documentation for the server.
2. **For CICS Client for DOS only.** You must run the CICSDOSC program before you can start the client.
3. On the client workstation, enter the command `CICSCLI /s=servername`, (or click on the equivalent icon), where `servername` is the name of the server from the client initialization file.

**Note:** For CICS Client for Macintosh, you can do this using the CICS Client for Macintosh Administration Utility (see “The CICS Client for Macintosh Administration Utility” on page 170).

4. After a few moments, enter the command `CICSCLI /1`, or click on the equivalent icon. This displays information on the status of the servers to which the client is connected or attempting connection. Verify that the server is available.

If the connection to the server cannot be made, examine any messages and the client error log to determine the cause of the error (see Chapter 8, “Problem determination” on page 213).

## An introduction to the CICS clients commands

---

### Chapter 6. Operation

**This chapter describes**

- “An introduction to the CICS clients commands”
- “CICS Client for DOS operation” on page 166
- “CICS Client for OS/2 operation” on page 166
- “CICS Client for Windows operation” on page 167
- “CICS Client for Windows 95 operation” on page 167
- “CICS Client for Windows NT operation” on page 167
- “Running CICS Client for Windows NT as a Windows NT service” on page 168
- “CICS Client for Macintosh operation” on page 169
- “CICS clients icons” on page 172
- “The CICSCLI command” on page 176
- “The CICSTERM command” on page 185
- “The CICSPRNT command” on page 190
- “The CICSTERP command (CICS Client for DOS only)” on page 197
- “Font selection on terminal emulators” on page 201
- “CICS Client telnet terminal support” on page 202

This chapter describes the commands for controlling CICS clients, their terminal emulation, and printer support. There is a detailed reference section for each command.

---

### An introduction to the CICS clients commands

You can use the following commands to provide control of client operation:

- “The CICSCLI command”  
This command is used to start and stop the client process, check the availability of servers, and set other options.
- “The CICSTERM command”  
This command starts a terminal emulation session with particular options.
- “The CICSPRNT command”  
This command starts a printer terminal session with particular options.
- “The CICSTERP command (CICS Client for DOS only)”  
This command, for CICS Client for DOS only, starts a printer and terminal session with particular options.

## CICS Client for OS/2 operation

These commands are the basis of icons supplied with all CICS clients apart from CICS Client for DOS.

The CICS clients start automatically when any of their functions (EPI, ECI, or 3270 terminal emulation) are invoked at the workstation. It is not necessary to first use the CICSCCLI command to start the client; you can simply run CICSTERM and CICSPRNT or double-click on their icons and the client is started with the necessary server connections.

**Note:** This does not apply for CICS Client for DOS, which you must always start using the CICSDOSC command.

For CICS Client for Macintosh the CICSCCLI command is simulated by the CICS Client for Macintosh Administration Utility (see “The CICS Client for Macintosh Administration Utility” on page 170).

---

## CICS Client for DOS operation

You enter the CICSCCLI, CICSTERM, CICSPRNT, and CICSTERP commands at the DOS command prompt.

You can also include these commands with your required command options in batch files.

For CICS Client for DOS, you must enter CICSDOSC before entering any CICSCCLI commands at the DOS prompt. This automatically loads CICSC TSR and starts CICS Client for DOS with the /s and /q options. You can also specify up to nine additional CICSCCLI options when you enter CICSDOSC at the DOS prompt.

---

## CICS Client for OS/2 operation

The CICS Client for OS/2 folder (see Figure 26) contains icons for controlling client operation (see “CICS clients icons” on page 172). These icons are based on the CICSCCLI, CICSTERM, and CICSPRNT commands, which you enter at the OS/2 command prompt.

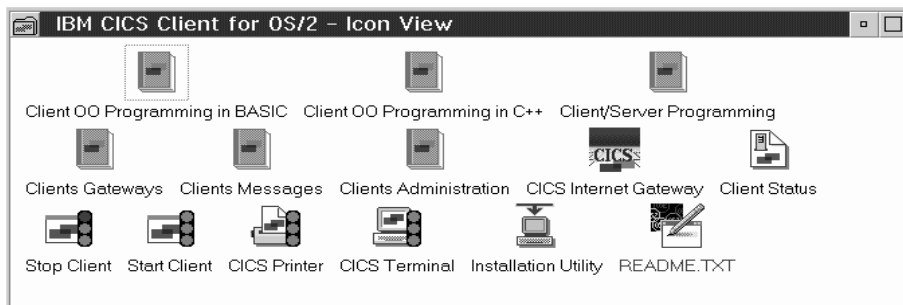


Figure 26. CICS Client for OS/2 folder



## CICS Client for Windows NT operation

---

### CICS Client for Windows operation

The CICS Client for Windows group window (see Figure 27) contains icons for controlling client operation (see “CICS clients icons” on page 172). These icons are based on the CICSCLI, CICSTERM, and CICSPRNT commands, which you enter via the **Run...** option in the Program Manager File menu.

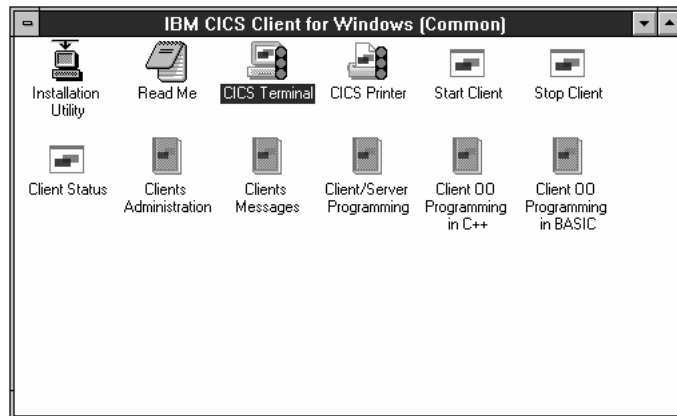


Figure 27. CICS Client for Windows group window

---

### CICS Client for Windows 95 operation

When you click the **Start** button and select **Programs**, you will see that the CICS Client for Windows 95 folder contains icons for controlling client operation (see “CICS clients icons” on page 172). These icons are based on the CICSCLI, CICSTERM, and CICSPRNT commands, which you enter via the **Run...** command in the **Start** menu.

---

### CICS Client for Windows NT operation

The CICS Client for Windows NT group window (see Figure 28) contains icons for controlling client operation (see “CICS clients icons” on page 172). These icons are based on the CICSCLI, CICSTERM, and CICSPRNT commands, which you enter via the **Run...** option in the Program Manager File menu, or at the MS-DOS command prompt.

## CICS Client for Windows NT operation

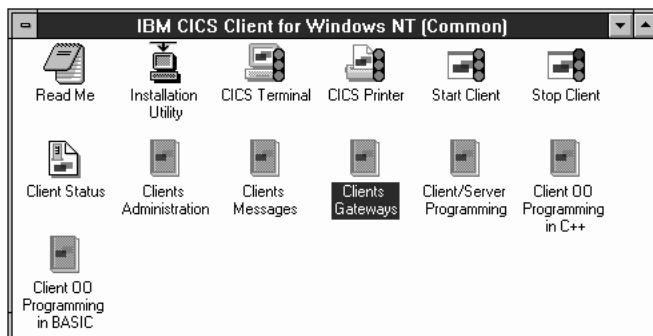


Figure 28. CICS Client for Windows NT group window

### Running CICS Client for Windows NT as a Windows NT service

You can run CICS Client for Windows NT as a Windows NT service, if you select to register it as a service during installation. Running CICS Client for Windows NT as a Windows NT service has several advantages:

- You can have the CICS Client for Windows NT service started automatically at Windows NT startup, without having to log on to the computer.
- You can log off from Windows NT and keep CICS Client for Windows NT running, thereby avoiding restarting the Client and its connection to CICS when you log on to Windows NT again.
- Relevant messages associated with running CICS Client for Windows NT as a service are recorded in the Application log and System log of the Windows NT Event Viewer when the service is started and stopped.

CICS Client for Windows NT is registered as a Windows NT services during installation. After installation, the Services dialog box in the Control Panel contains the **IBM CICS Client** service.

#### Starting and stopping the service

To start the IBM CICS Client service, select the service in the Services dialog box, and select **Start**. A message is displayed and the service is started.

To stop the IBM CICS Client service, select the service in the Services dialog box, and select **Stop**. A message is displayed and the service is stopped.

#### Startup parameters for the CICS services

You may choose to start the CICS Client for Windows NT service automatically at Windows NT startup.

To specify automatic startup, select **Startup** in the Services dialog box. The Service panel is then displayed:

**Note:** You must have Administrator authority to configure service startup.

## CICS Client for Macintosh operation

Select the **Automatic** radio button, and make sure that the **System Account** radio button is selected.

The Service panel also allows you to specify a Manual startup for the service, and to disable the service.

For more information on services and their configuration, refer to the Windows NT documentation.

---

### CICS Client for Macintosh operation

The CICS Client for Macintosh bin folder shown in Figure 29 contains icons for controlling client operation, (see “CICS clients icons” on page 172).

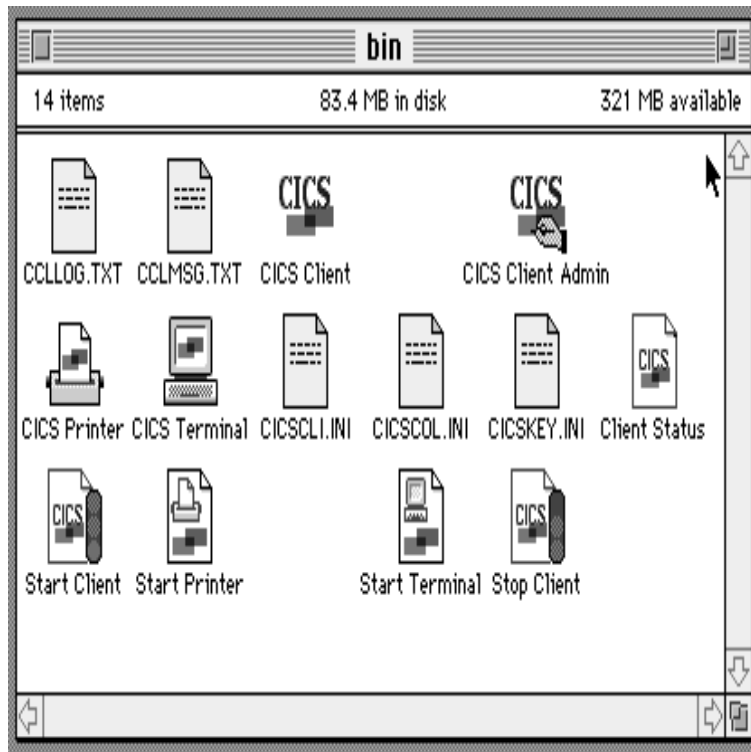


Figure 29. CICS Client for Macintosh bin folder

These icons include the CICS Client for Macintosh Administration Utility, which provides radio button and menu options with the same functions as the CICSCLI command of other CICS clients (see “The CICS Client for Macintosh Administration Utility” on page 170).

## CICS Client for Macintosh operation

You can create options files for the CICS Terminal and CICS Printer icons so that these functions are invoked with the options that you require. (See "Creating options files for CICS Client for Macintosh" on page 172 for information on creating options files.)

### The CICS Client for Macintosh Administration Utility

The CICS Client for Macintosh Administration Utility provides the same functions as the CICSCLI command of other CICS clients, that is, it is used to start and stop the client process, check the availability of servers, and set other options (see "The CICSCLI command" on page 176).

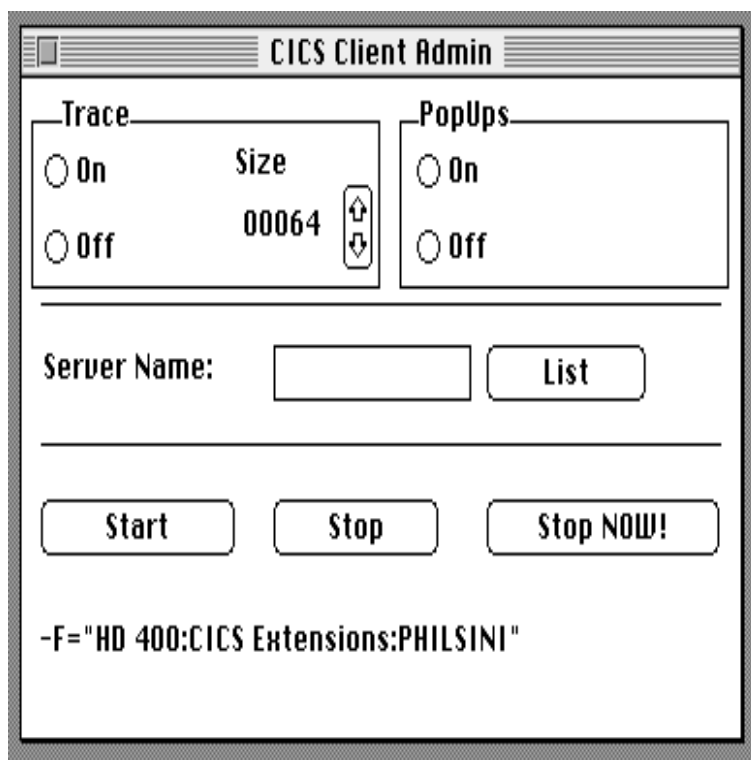


Figure 30. CICS Client for Macintosh Administration Utility

You can start the utility directly by double-clicking on its icon, in which case a dialog is invoked. Alternatively, you can start the utility indirectly by double-clicking on a text file containing CICSCLI command options - an options file. (see "Creating options files for CICS Client for Macintosh" on page 172). The utility is then started with the command options in the options file. There are several supplied options files in the bin folder, and you can also create your own using any standard text file editor. To create your own, copy one of the supplied files, rename, it and then edit it to include the CICSCLI options you require. The options file must have file type 'TEXT' and creator type 'CICX' (See "Creating options files for CICS Client for Macintosh" on page 172).

## CICS Client for Macintosh operation

The CICS Client for Macintosh Administration Utility panel contains radio buttons with functions as follows:

Button	Function
<b>Start</b>	Starts the client control process (CICSCLI /s).
<b>Stop</b>	Stops the client control process (CICSCLI /x).
<b>Stop Now</b>	Stops the client control process immediately (CICSCLI /i).
<b>List</b>	Lists connected servers (CICSCLI /l).
<b>Trace On</b>	Enables client trace (CICSCLI /d).  If you select this button before the client is started, it has no effect until you select the <b>Start</b> button. You use the <b>Trace Size</b> scroll box to set the maximum size of the data areas to be traced. (This is equivalent to the CICSCLI /d=nnn command.)
<b>Trace Off</b>	Disables client trace (CICSCLI /o).  If you select this button before the client is started, it has no effect until you select the <b>Start</b> button.
<b>Pop-ups On</b>	Enables display of pop-up messages (CICSCLI /e).  If you select this button before the client is started, it has no effect until you select the <b>Start</b> button.
<b>Pop-ups Off</b>	Disables display of pop-up messages (CICSCLI /n).  If you select this button before the client is started, it has no effect until you select the <b>Start</b> button.

When you enter a server name in the **Server Name** field, the action of the **Start**, **Stop**, and **Stop Now** is altered to the equivalent of the /s=servername, /i=servername, and /x=servername options of CICSCLI.

The **File** menu for the CICS Client for Macintosh Administration Utility contains the following options:

### Choose Initialization File

Allows you to specify the name of the client initialization file (CICSCLI /f). The name of the client initialization file is stored in a text file in the Preferences folder and is displayed on the CICS Client for Macintosh Administration Utility panel. You must stop the client before changing the client initialization file. The new file is then used when you start the client again.

### Security

Allows you to set up the security options for a connection to a CICS server. In the dialog box you can enter:

- Server Name (CICSCLI /c option)
- Userid (CICSCLI /u option)

## CICS clients icons

- Password (CICSCLI /p option)

You select the security options by selecting **OK**.

## Creating options files for CICS Client for Macintosh

You can create plain-text ASCII files containing options for the CICS Client for Macintosh Administration Utility, CICS Terminal, and CICS Printer icons. (These options correspond to the command options of the CICSCLI, CICSTERM, and CICSPRNT commands respectively, see “The CICSCLI command” on page 176, “The CICSTERM command” on page 185 and “The CICSPRNT command” on page 190.)

You can drag and drop the icon for such an options file onto the CICS Client for Macintosh Administration Utility, CICS Terminal, and CICS Printer icons in the bin folder, to invoke these programs with your chosen options.

If the options file is created with the file type ‘TEXT’ and the appropriate creator type, you can double-click on the icon for the file to launch the associated program:

<b>Creator</b>	<b>Program</b>
<b>CICE</b>	CICS Terminal
<b>CICP</b>	CICS Printer
<b>CICX</b>	CICS Client for Macintosh Administration Utility

You can create as many options files as you need using a text editor such as Simple Text or Teach Text. Each options files should contain just one command line, with all the options you require.

For example, an options file to start a 3270 terminal emulation session (see “Using CICSTERM” on page 185) might contain:

```
/s=CICS0S2 /t=CESN /k=mykeys.ini /c=mycols.ini /n=cicsv123 /q
```

To create your own options file:

- Make a copy of a supplied options file, and rename it using Finder.
- Open the options file using Simple Text or another plain-text editor.
- Change the command options as required.
- Ensure that the file has the file type ‘TEXT’ and the appropriate creator type.
- Save the options file.

---

## CICS clients icons

All CICS clients (apart from CICS Client for DOS) are supplied with the following icons:

### **Start Client**

Starts the client according to the definitions in the client initialization file.

This is equivalent to the command CICSCLI /s.

## CICS clients icons

### Stop Client

Stops the client.

This is equivalent to the command `CICSCLI /x`.

### CICS Terminal

Starts a 3270 terminal emulation session according to definitions in the client initialization file.

This is equivalent to the command `CICSTERM`.

### CICS Printer

Starts a CICS print terminal session according to definitions in the client initialization file.

This is equivalent to the command `CICSPRNT`.

### Client Status

Lists connected servers.

This is equivalent to the command `CICSCLI /l`.

You can tailor the properties of these icons, and add new icons according to the command variations you require for your client (see “Customizing the command icons for CICS Client for OS/2 and CICS Client for Windows Family”).

## Customizing the command icons for CICS Client for OS/2 and CICS Client for Windows Family

You can customize your CICS clients installation to ensure that the command functions you use most frequently are associated with icons.

For example, you might want to create an icon for:

```
CICSCLI /s=servername /q /d=nnn /f=mycli.ini
```

to start a connection to a server used for testing applications.

### Creating command icons for CICS Client for OS/2

To create a new command icon for CICS Client for OS/2:

1. Select a command icon that issues a command similar to the one you wish to create.
2. Enter the name for the new command icon in the **Copy** dialog window and select the **Copy** push button.
3. Open the settings dialog for the newly copied icon and edit the list of command options in the **Parameters** field to create the option sequence that you require (see Figure 31 on page 174).

## CICS clients icons

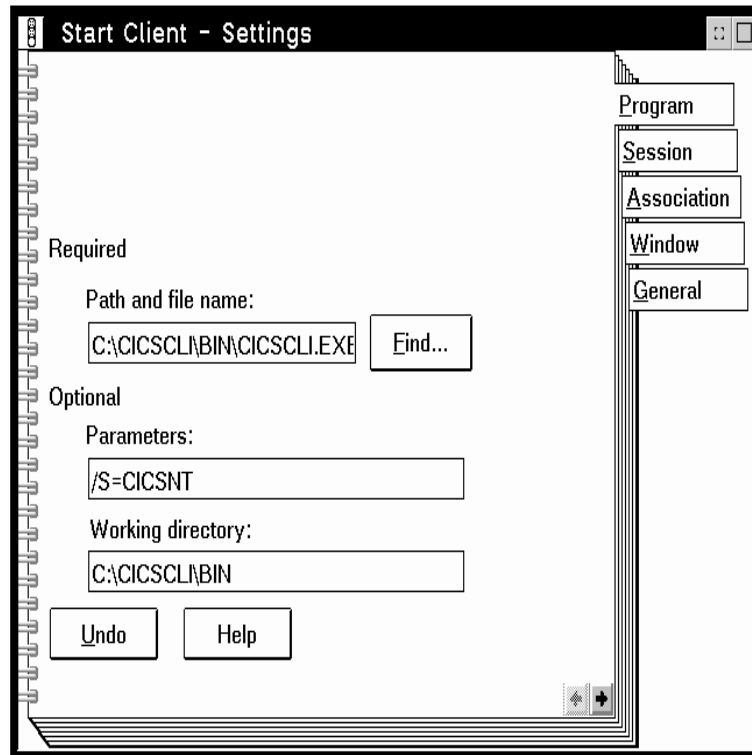


Figure 31. Creating a command icon for CICS Client for OS/2

4. Change the title in the General page of the settings notebook.
5. Close the settings dialog.

### Creating command icons for CICS Client for Windows and CICS Client for Windows NT

To create a command icon for CICS Client for Windows and CICS Client for Windows NT, you can copy a program item and tailor it to your requirements, or simply create a new program item with the appropriate command options in the **Command Line** entry field. (See Figure 32 on page 175.)



## CICS clients icons

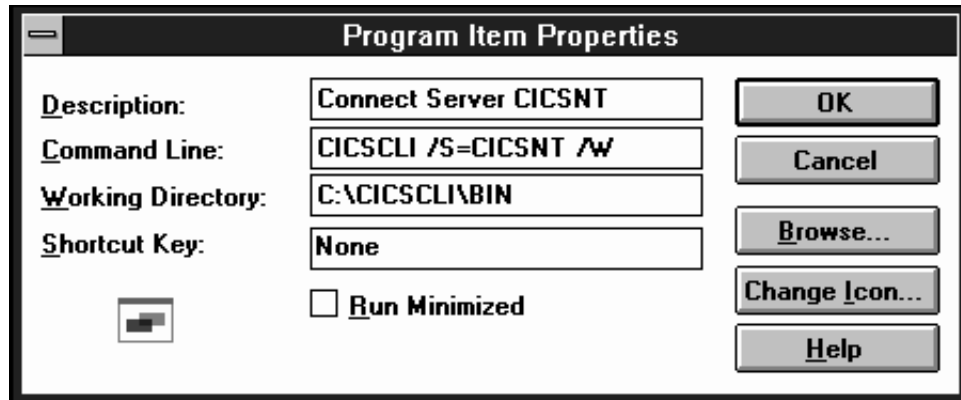


Figure 32. Creating a command icon for CICS Client for Windows and CICS Client for Windows NT

**Note:** If you are running CICS Client for Windows NT under Windows NT Version 4.0, the procedure is as described in “Creating command icons for CICS Client for Windows 95.”

### Creating command icons for CICS Client for Windows 95

To create a command icon for CICS Client for Windows 95, you can copy an existing program item and change its properties:

1. Open the CICS Client for Windows 95 folder.
2. Copy a program item similar to the one you require, and rename it.
3. Select the new program item.
4. Select **Properties** from the **File** menu, and enter the required settings for the new icon in the Shortcut page.

## The CICSCLI command

---

### The CICSCLI command

You use the CICSCLI command to:

- Start the client control process, and start communication with CICS servers (/s parameter)
- Stop the client control process (/i and /x parameters)
- Specify the client initialization file to use (/f parameter)
- Turn client trace on (/d parameter)
- Turn client trace to memory on (/t parameter)
- Dump the client trace in memory to a file (/z parameter)
- Turn client trace off (/o parameter)
- Set up security (/c, /u, and /p parameters)
- List connected CICS servers (/l parameters)
- Enable the display of pop-up messages (/e parameter)
- Disable the display of pop-up messages (/n parameter)

The following sections provide examples of using the CICSCLI command. Full details of the command syntax are given in “CICSCLI command reference” on page 182.

### Starting the client control process

To start the client control process, enter:

```
CICSCLI /s
```

To start the client control process and start communication with a CICS server, enter:

```
CICSCLI /s=servername
```

where *servername* is the name of a CICS server.

**Note:** For CICS Client for OS/2 and CICS Client for Windows Family, you can start the CICS client by double-clicking on the **Start Client** icon.

For CICS Client for DOS, you must enter CICSDESC before entering any CICSCLI commands at the DOS prompt. This automatically loads CICSCTSR and starts CICS Client for DOS with the /s and /q options. You can also specify up to nine additional CICSCLI options when you enter CICSDESC at the DOS prompt.

### Starting connections with additional servers

You can start connections to servers when the CICS client is already running. When the CICS client has been started using the /s option, or when connections to additional servers are to be started, enter:

```
CICSCLI /s=servername
```

## The CICSCLI command

where *servername* is the name of a CICS server.

### Stopping the client control process

This section describes the different ways in which you can stop the client control process with the CICSCLI command.

#### Stopping in a controlled manner

To stop the client control process for all connected servers after all outstanding units of work have completed, enter:

```
CICSCLI /x
```

To terminate the session with a particular server, enter:

```
CICSCLI /x=servername
```

where *servername* is the name of a CICS server. This only stops the session with the named server, it does not stop the client control process.

**Note:** For CICS Client for OS/2 and CICS Client for Windows Family, you can stop the CICS Client by double-clicking on the **Stop Client** icon.

#### Stopping immediately

To stop the client control process for all connected servers without completing outstanding units of work, enter:

```
CICSCLI /i
```

To terminate the session with a particular server, enter:

```
CICSCLI /i=servername
```

where *servername* is the name of a CICS server. This only stops the session with the named server, it does not stop the client control process.

### Specifying which client initialization file to use

To use a client initialization file other than the default CICSCLI.INI, enter:

```
CICSCLI /s /f=filename
```

where *filename* is the name of the file. The /f parameter can be used only with the /s parameter, and only if the client is not already started.

### Turning on client trace

To turn on the trace for a client, enter, for example:

```
CICSCLI /d=nnn
```

where *nnn* is the maximum size of the data areas to be traced.

If you need to trace the client from the startup sequence, you can specify the /s and /d parameters together.

## The CICSCLI command

The trace is written to the file specified by the TraceFile parameter in the client initialization file (CICSCLI.LOG by default).

### Turning on client trace to memory

To turn on the trace to memory for a client, enter, for example:

```
CICSCLI /t=nnn
```

where *nnn* is the maximum size in bytes of the data areas to be traced (the default is 64).

If you need to trace the client from the startup sequence, you can specify the /s and /t parameters together.

### Dumping client trace in memory

To write the client trace in memory to a file, enter:

```
CICSCLI /z
```

This writes the internal memory buffer to the file specified by the DumpFile parameter in the client initialization file (CICSCLI.DMP by default).

### Turning off client trace

To turn off the trace for a client, including the trace to memory, enter:

```
CICSCLI /o
```

### Setting up security

Some servers require that a userid and password be provided by the client before they permit either ECI or EPI activity to be performed. For example, a CICS for MVS/ESA server may require that a userid and password is provided before any ECI action is performed.

The client application may provide a userid and password via the ECI parameter block. If this is not provided, and the client does not have a current user and password to be used for communication with this specific server, you are prompted to provide the details. In this case, if the userid or password entered are not valid, or the password has expired, you are prompted to re-supply a userid and password, or to change the expired password. The values you enter are saved for future ECI invocations. As an alternative, you can supply or change the userid and password using the CICSCLI command.

If the userid and password used to communicate with the server are incorrect, and were not explicitly specified in the ECI parameter block, you are prompted again for a new pair of values when the application or emulator runs. You can cancel the request, in which case the ECI call fails with an error return code.

**Note:** CICSCLI /n suppresses prompting for userid and password, and returns security errors to the application.

## The CICSCLI command

For terminal emulators and EPI, the situation is similar to that described for ECI. The client holds only a single userid and password for each server. Therefore, if values have already been set as a result of ECI activity, you are not prompted for the information when a terminal is installed at the server, or when EPI is used. However on terminal install, you are prompted to re-supply a userid and password, or to change the expired password if necessary.

To identify a server to which security information is to be associated, enter:

```
CICSCLI /c=servername
```

where *servername* is the name of a CICS server.

To set a userid to be used when accessing this server, enter:

```
CICSCLI /c=servername /u=userid
```

where *userid* is the userid.

To set a password to be used when accessing this server, enter:

```
CICSCLI /c=servername /p=password
```

where *password* is the password.

You can enter the /u and /p parameters together.

You can also specify the security parameters when starting the client:

```
CICSCLI -s=servername -u=userid -p=password
```

The **UpperCaseSecurity** parameter of the client initialization file determines whether userids and passwords are converted to uppercase. If this parameter is set to Y, you can enter userids and passwords in either uppercase or lowercase.

**Note:** Userids and passwords must not contain DBCS characters.

### Listing the connected servers

To list all the servers connected to a client and their status, enter:

```
CICSCLI /l
```

A list like the following is displayed:

```
CCL8001I CICSCLI - CICS Client Control Program
CCL0002I (C) Copyright IBM Corporation 1994,1998. All rights reserved.
CCL8041I The CICS client is using the following servers:
CCL8042I Server 'CICS0S2' (using 'TCP/IP' to 'CICS0S2') is available
CCL8043I Server 'CICSNT' (using 'NETBIOS' to 'CICSNT') is unavailable
```

**Note:** For CICS Client for OS/2 and CICS Client for Windows Family, you can list the connected servers by double-clicking on the **Client Status** icon.

## The CICSCLI command

### Disabling the display of messages

To disable the display of all messages output with the command, enter, for example:

```
CICSCLI /s /q
```

### Enabling and disabling the display of pop-up messages

There may be times when you do not want messages (client error and security) to appear in pop-up windows. (These pop-up messages include those not associated with the client control process.) For example, if you leave CICS clients running unattended (overnight perhaps), you would not want messages appearing when the pop-up window cannot be closed.

To disable the display of pop-up messages, enter:

```
CICSCLI /n
```

To enable the display of pop-up messages again, enter:

```
CICSCLI /e
```

You can specify the /n parameter together with the /s parameter.

The display of pop-up messages is enabled by default.

### Displaying the command parameters

To display the parameters of the CICSCLI command, enter:

```
CICSCLI /?
```

The following is displayed:

```
CCL8001I CICSCLI - CICS Client Control Program
CCL0002I (C) Copyright IBM Corporation 1994, 1998. All rights reserved.
CCL8002I Command options are:
CCL8003I /S[=server] - To start the client [and connect to a server]
CCL8004I /X[=server] - To close the client [or connection to a server]
CCL8005I /I[=server] - To abort the client [or connection to a server]
CCL8006I /L - To list active server connections
CCL8007I /D[=size] - To enable service tracing [and set a size limit]
CCL8008I /O - To disable all service tracing
CCL8009I /C=server - To specify the name of server for security changes
CCL8010I /C must be specified with one or both of /U and /P
CCL8011I /U[=userid] - To set the userid to be used with a server
CCL8012I /P[=password] - To set the password to be used with a server
CCL8013I /N - To suppress the client error and security pop-ups
CCL8014I /E - To activate the client error and security pop-ups
CCL8015I /F=inifile - To specify a client initialization file
CCL8016I /W - To wait for confirmation before completing
CCL8017I /Q - To inhibit all output messages
CCL8018I /T[=size] - To enable service tracing to memory
CCL8019I /Z - To dump service trace in memory to file
CCL8022I CICSCLI performed no action
```

## The CICSCLI command

### CICSCLI and applications

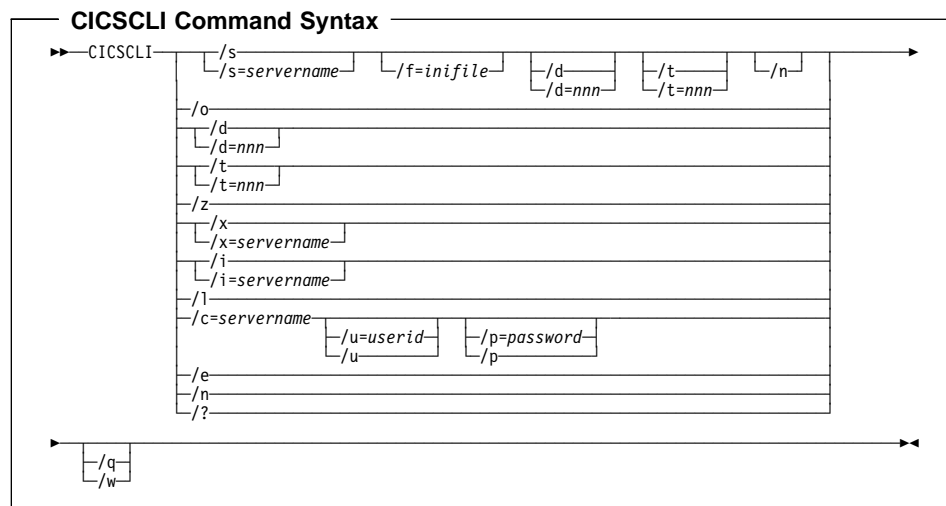
You can call CICSCLI from within applications, as long as this is supported by the programming language. You can therefore enter CICSCLI at the command line, then run an application to call CICSCLI with additional parameters.

## The CICSCLI command

### CICSCLI command reference

To conform with other popular syntax conventions, this slash character may be replaced with a minus sign (-). The commands and options are not case-sensitive. All options of the form */x=variable* may contain spaces in the variable part, if it is enclosed in double quotes. Double quotes within variables must be entered as `\"`, that is with a backslash preceding the double quote.

For an explanation of syntax diagrams, see “Command syntax” on page xvii.



The options are:

#### ***/c=servername***

Identifies the name of the server to which security information in the form of a userid and password is to be associated. Some CICS servers require that the user provide security information to the server before interacting with the server. The CICS client prompts the user at the workstation for a userid and password, unless these have already been provided via CICSCLI (see the descriptions of the */u* and */p* options).

#### ***/d***

Turns the debug trace on for the client. If tracing is required while the client is starting up, this option may be specified along with the */s* option.

*nnn* is the maximum size of data areas to be traced in bytes. The range is 1 through 32767 bytes, and the default is 64 bytes.

Output from the trace option is directed to the file specified by the TraceFile parameter in the client initialization file (CICSCLI.LOG by default). The trace file is generated as an ASCII file, ready to read with a text editor.

#### ***/e***

Enables the display of client error and security messages in pop-up windows.



## The CICSCLI command

- /f=*infile*** Specifies the name of the client initialization file. The default is CICSCLI.INI. If the file is not in the \CICSCLI\BIN directory, you must specify the full path name.
- Note:** If the file resides on a redirected network drive then problems may occur if the network drive is later detached.
- /i** Stops the client immediately. The options */i=servername* and */i* operate as for */x=servername* and */x* respectively *but* the client does not wait for outstanding units of work to complete. Stopping the client in this way may result in a loss of data at connected servers.
- /l** Causes a list of all connected servers to be displayed. For each server, the netname of the server as it is known to the client is also displayed, as well as the state of the connection to the server and the connection protocol. For CICS Client for DOS and CICS Client for OS/2, one line per server is displayed. For CICS Client for Windows Family and CICS Client for Macintosh, the data is displayed in a window.
- /n** Disables the display of client error and security messages in pop-up windows.
- Any messages that would have been logged are still logged.
- /o** Turns off trace (including trace to memory) if it is already active.
- /p=*password*** Sets the current password to be used when accessing the server specified by the */c* parameter. (Or by the */s* parameter.) This password is used if the server requires a password (and userid) before running transactions on the client's behalf.
- For ECI applications, any userid and password specified in the ECI parameter block overrides values set via the CICSCLI command.
- Specifying */p* or */p=* (that is, no password is specified) resets the associated password to a null value.
- /q** Disables the display of all messages output with the CICSCLI command.
- /s** Starts the client control process. No attempt is made to initiate communication with a server unless */s=servername* is specified. In this case, the control process also connects to the server using information specified in the client initialization file. The *servername* must exist in the client initialization file.
- /t** Turns the trace to memory on for the client. If tracing to memory is required while the client is starting up, this option may be specified along with the */s* option.
- nnn* is the maximum size of data areas to be traced in bytes. The range is 1 through 32767 bytes, and the default is 64 bytes.
- The client trace to memory writes trace records to an internal buffer that is dumped to a file using the CICSCLI */z* command, and also if the CICS Client for OS/2 terminates abnormally.

## The CICSCLI command

***/u=userid*** Sets the current userid to be used when accessing the server specified by the */c* parameter. (Or by the */s* parameter.) This userid is used if the server requires a userid (and password) before running transactions on the client's behalf.

For ECI applications, any userid and password specified in the ECI parameter block overrides values set via the CICSCLI command.

Specifying */u* or */u=* (that is, no userid is specified) resets the associated userid to a null value.

***/w*** Prompts the user, before the command completes, to press the Enter key, to confirm that messages output to the screen (both informational and error) have been read.

**Note:** This option applies only to CICS Client for DOS and CICS Client for Windows Family.

***/x*** Stops the client in a controlled manner. If */x=servername* is specified, then when all outstanding units of work on the specified server have completed, the connection to the server is terminated. If other server connections are active, these remain unchanged.

If */x* is specified without a servername, the client waits for all outstanding units of work to complete, terminates all connections to servers, and ends the control process. Using */x* or */x=servername* is the preferred way of stopping the client.

***z*** If client trace to memory is enabled, writes the records in the internal buffer to the file specified by the DumpFile parameter in the client initialization file (CICSCLI.DMP by default). The buffer is cleared after dumping, and tracing continues. The trace records are appended to the file, if it already exists. The dump file is generated as an ASCII file, ready to read with a text editor.

The trace records in the memory buffer are also dumped to the file if the CICS Client for OS/2 terminates abnormally.

***/?*** Causes the command syntax to be displayed.

## The CICSTERM command

---

### The CICSTERM command

The CICSTERM command is used to control 3270 terminal emulation. You can start emulator sessions, specify terminal emulator characteristics, and the names of the keyboard mapping and color mapping files.

You can have multiple terminal emulation sessions running simultaneously.

For CICS Client for DOS, CICS Client for OS/2, and CICS Client for Windows Family, the CICSTERM command detects whether the hardware on which the client is running is enabled for double-byte character set (DBCS) display. If it is, the emulator can display DBCS characters.

**Note:** Some uses of servers and protocols require a model terminal definition for the emulator that explicitly specifies that the client wants to display DBCS.

### Using CICSTERM

You use the CICSTERM command to:

- Start a 3270 terminal emulator (/s or /r parameter)
- Specify the initial transaction (/t parameter)
- Specify the name of the keyboard mapping file (/k parameter)
- Specify the name of the color mapping file (/c parameter)
- Define the 3270 terminal emulator characteristics (/n and /m parameters)
- Determine the print file processing (/p parameter)
- Specify a file to which print files are appended (/f parameter)

You issue the CICSTERM command *once* with all the parameters you require.

The following is an example of a CICSTERM command:

```
CICSTERM /s=CICS0S2 /t=CESN /k=mykeys.ini /c=mycols.ini  
/n=cicsv123 /f=c\print.txt /q
```

In this example:

**/s=CICS0S2**

Specifies that a 3270 terminal emulator is started for the server CICS0S2.

**/t=CESN**

Specifies that the initial transaction is CESN.

**/k=mykeys.ini**

Specifies that the keyboard mapping file is named as mykeys.ini.

**/c=mycols.ini**

Specifies that the color mapping file is named as mycols.ini.

**/n=cicsv123**

Specifies that the 3270 terminal emulator characteristics are defined by the terminal definition cicsv123.

## The CICSTERM command

### **`/f=clprint.txt`**

Specifies that the print file will be appended to the file clprint.txt.

### **`/q`**

Specifies that the display of messages output by the command is disabled.

All parameters of CICSTERM are optional. That is, you can enter the CICSTERM command without any parameters, and defaults are taken from the client initialization file. (This is equivalent to double-clicking on the CICS Terminal icon.) Full details of the parameters are given in "CICSTERM command reference" on page 187.

### **Options files for CICSTERM**

For CICS Client for Macintosh you can create a flat ASCII file containing the required CICSTERM command parameters. When you drag and drop this options file onto the CICSTERM emulator icon, CICSTERM runs with your chosen parameters. If you create this options file with file type 'TEXT' and creator type 'CICE', the file will have an appropriate icon, and will allow double-clicking to launch CICSTERM.

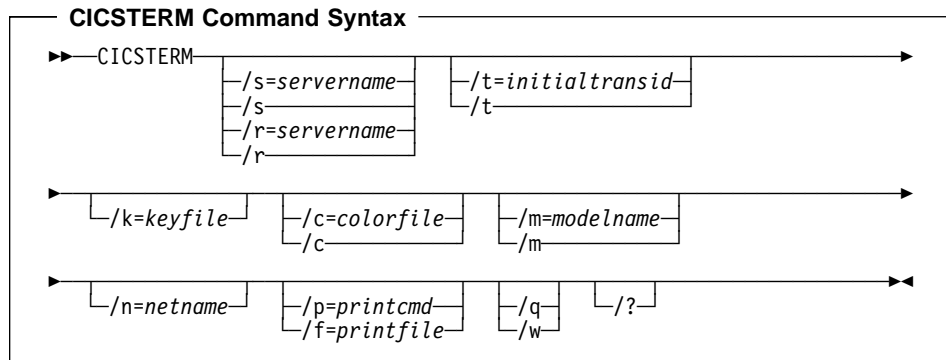
## Stopping a terminal emulator

To stop a terminal emulator, enter the string specified by TerminalExit in the client initialization file. This is EXIT by default.

## The CICSTERM command

### CICSTERM command reference

For an explanation of syntax diagrams, see “Command syntax” on page xvii.



The options are:

**/c=***colorfile* Identifies the name of a color mapping file (see “Customizing the screen colors” on page 161) to be used with the emulator. If this parameter is omitted, the environment variable CICSCOL is assumed to identify the color mapping file. If CICSCOL is not defined, a filename of CICSCOL.INI in the current directory is assumed.

**Note:** For CICS Client for Macintosh, you can identify a color mapping file by using an options file (see “Options files for CICSTERM” on page 186).

If the parameter is specified as /c=, (that is, the color mapping filename is omitted), the emulator runs without any color definitions.

**/f=***printfile* Specifies the name of a file to which the output of print requests is appended. If the name of the file contains embedded blanks, it must be surrounded by double quotes (“”). Any double quotes within the name of the file must be entered as backslash double quote (“”).

If neither of the /f or /p parameters is provided, the PrintCommand or PrintFile parameter in the client initialization file defines the command, file, or default action to take with print requests.

**/k=***keyfile* Identifies the name of a keyboard mapping file (see “Keyboard mapping file syntax” on page 155) to be used with the emulator. If this parameter is omitted, the environment variable CICSKEY is assumed to identify the key mapping file. If CICSKEY is not defined, a filename of CICSKEY.INI in the current directory is assumed.

**Note:** For CICS Client for Macintosh, you can identify a keyboard mapping file by using an options file (see “Options files for CICSTERM” on page 186).

**/m=***modelname*

Specifies the name of a model terminal definition, as known at the server to which the emulator is to connect, to be used to define the terminal

## The CICSTERM command

characteristics. If neither this parameter nor */n=netname* is specified, any ModelTerm value from the client initialization file is used. If no ModelTerm value has been specified in the initialization file, the server's default terminal definition is assumed.

If the parameter is specified as */m=* (that is, the modelname is omitted), any ModelTerm value specified in the initialization file is ignored, and the server's default terminal definition is assumed.

This option is case-sensitive.

### */n=netname*

Specifies the name of a particular terminal definition at the server that this emulator is to be installed as. The precise interpretation of netname varies between servers, for example, on CICS for OS/2 it references a termid defined in the CICS tables, on CICS for AIX it is a netname.

This option is case-sensitive.

### */p=printcmd*

Specifies an operating system command used to process the temporary print file generated when print requests are received by the terminal emulator. If the command contains embedded blanks, then the command must be surrounded by double quotes (""). Any double quotes within the command must be entered as backslash double quote (\").

If neither of the */f* or */p* parameters is specified, the PrintCommand or PrintFile parameter in the client initialization file defines the command, file, or default action to take with print requests.

The temporary print file is post-processed by appending the filename to the command, and executing the resultant command. Thus print output may simply be copied to a local printer, copied into a permanent file, processed further for inclusion into a document, and so on. If the temporary file is to be processed by a print command, the command is responsible for deleting the temporary file.

**Note:** This option does not apply to CICS Client for Macintosh, because this client does not support print commands.

### */q*

Disables the display of all messages output by the command.

### */s=servername* or */r=servername*

Specifies the name of the server that the terminal emulator is to be connected to. This servername must correspond to an entry in the client initialization file. You can specify */s*, or */r*, but not both.

If neither parameter is specified, the first server entry in the initialization file is used.

If the parameter is specified as */s* or */r* (that is, no servername is provided) then, if the initialization file identifies more than one potential server to which the client can connect, the user is prompted to select from a list of available servers. These prompts are generated even if the */q* parameter is specified.

## The CICSTERM command

If there is only one potential server identified in the initialization file, that server is used and the user is not prompted.

### */t=initialtransid*

Identifies the initial transaction to be invoked for this terminal. If this option is omitted, any initial transaction specified in the client initialization file is run. The string may be up to 128 characters long, specifying both a transaction name, and parameters to be passed to the transaction. The transaction name is the first four characters or the characters up to the first blank in the string. The rest of the string is the parameter data.

If the parameter is specified as /t= (that is, the initialtransid is omitted), any initial transaction specified in the initialization file is ignored.

This option is case-sensitive.

**Note:** Be careful that transactions that you specify either here or in the client initialization file do not require terminal input to complete.

### */w*

Prompts the user, before the command completes, to press the Enter key, to confirm that messages output to the screen (both informational and error) have been read.

**Note:** This option is ignored for CICS Client for Windows Family and CICS Client for Macintosh.

### */?*

Causes the parameter syntax to be listed; any other options specified are ignored.

## The CICSPRNT command

---

### The CICSPRNT command

The CICSPRNT command is used to control 3270 printer terminal emulation.

Applications running on the server can direct output to a printer in one of two ways:

1. An application running from a terminal can initiate printing by sending a map or data with the PRINT indicator set
2. The user can start at the client a 3270 Print Terminal Emulator using the CICSPRNT command. A 3270 Print Terminal Emulator must be started for a netname or model terminal definition (or termid in the case of CICS for OS/2) predefined in the server's terminal tables. Output is directed to such a device by starting a transaction against the printer device.

**Note:** At client workstations you can use the PrintScreen key (as defined by the keyboard mapping file). Note however, that any lines that contain only null characters are not printed. For a 'blank' line to be printed, it must contain at least one space character.

### Using CICSPRNT

You use the CICSPRNT command to:

- Start a 3270 print terminal emulator (/s or /r parameter)
- Specify the initial transaction (/t parameter)
- Define the 3270 printer terminal emulator characteristics (/n and /m parameters)
- Determine the print file processing (/p parameter)
- Specify a file to which print files are appended (/f parameter)

You issue the CICSPRNT command once with all the parameters you require.

The following is an example of a CICSPRNT command:

```
CICSPRNT /s=CICS0S2 /n=P123 /t=XPRT /f=clprint.txt /q
```

In this example:

**/s=CICS0S2**

Specifies that a 3270 print terminal emulator is started for the server CICS0S2.

**/n=P123**

Specifies that the 3270 print terminal emulator characteristics are defined by the terminal definition v123 (in the terminal control table for CICS for OS/2 in this case.)

**/t=XPRT**

Specifies that the initial transaction is XPRT.

**/f=clprint.txt**

Specifies that the print file to which print requests are appended is clprint.txt.



## The CICSPRNT command

### **/q**

Specifies that the display of messages output by the command is disabled.

All parameters of CICSPRNT are optional, except that you must specify either */n=netname* or */m=modelname*. That is, you can enter the CICSPRNT command with just the */n* or the */m* parameter, or both, and defaults for other parameters are taken from the client initialization file. Full details of the parameters are given in "CICSPRNT command reference" on page 192.

If the system upon which the client is executing supports DBCS, it is assumed that the printer attached to the processor also supports DBCS. Conversely, if the system does not support DBCS, the client will not send DBCS data to the printer.

**Note:** CICS Client for Macintosh does not support DBCS.

### **CICS Printer icon**

For CICS Client for OS/2, when you double-click on the **CICS Printer** icon, the Specify Parameters dialog box is displayed. This allows you to enter the required parameters for CICSPRNT.

For all CICS clients, you should edit the settings for the icon to change the parameters according to your usage.

The CICSPRNT process runs as a minimized window, and the window can be enlarged to view the current status of the printer. You can use an action available from a pulldown menu to terminate the print function.

On CICS Client for DOS systems, you are presented with a panel while the program is running, from which the program can be terminated.

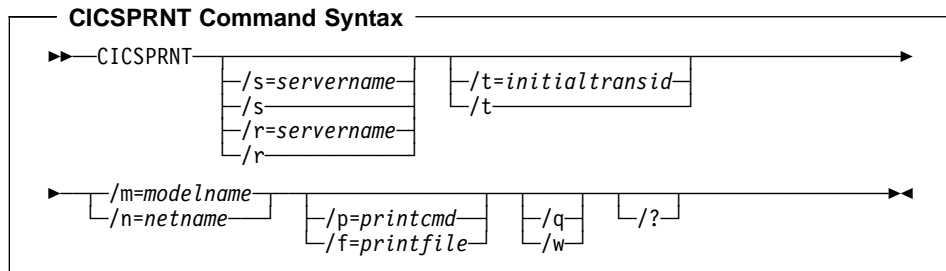
### **Options files for CICSPRNT**

For CICS Client for Macintosh you can create a flat ASCII file containing the required CICSPRNT command parameters. When you drag and drop this options file onto the CICSPRNT emulator icon, CICSPRNT runs with your chosen parameters. If you create this options file with file type 'TEXT' and creator type 'CICP', the file will have an appropriate icon, and will allow double-clicking to launch CICSPRNT.

## The CICSPRNT command

### CICSPRNT command reference

For an explanation of syntax diagrams, see “Command syntax” on page xvii.



The options are:

***/f=printfile*** Specifies the name of a file to which the output of print requests is appended. If the name of the file contains embedded blanks, it must be surrounded by double quotes (“). Any double quotes within the name of the file must be entered as backslash double quote (“\”).

If neither of the */f* or */p* parameters is provided, the PrintCommand or PrintFile parameter in the client initialization file defines the command, file, or default action to take with print requests.

***/m=modelname***

Specifies the name of a model terminal definition, as known at the server to which the 3270 Print Terminal emulator is to connect, to be used to define the terminal characteristics. If this parameter is not specified, any ModelTerm value from the client initialization file is used. If no ModelTerm value has been specified in the initialization file, the server’s default terminal definition is assumed.

You must specify either the */m* or the */n* option, or both.

This option is case-sensitive

***/n=netname***

Specifies the name of a particular terminal definition at the server that this 3270 Print Terminal emulator is to be installed as. The precise interpretation of netname varies between servers. For example, on CICS for OS/2 it references a termid defined in the terminal control table (TCT), on CICS for AIX it is a netname.

You must specify either the */m* or the */n* option, or both.

This option is case-sensitive.

***/p=printcmd***

Specifies a command used to process the temporary print file generated when print requests are received by the terminal emulator. If the command contains embedded blanks, then the command must be surrounded by double quotes (“). Any double quotes within the command must be entered as backslash double quote (“\”).

## The CICS<sup>®</sup>PRINT command

If neither of the `/f` or `/p` parameters is specified, the `PrintCommand` or `PrintFile` parameter in the client initialization file defines the command, file, or default action to take with print requests.

The temporary print file is post-processed by appending the filename to the command, and executing the resultant command. Thus print output may simply be copied to a local printer, copied into a permanent file, processed further for inclusion into a document, and so on. If the temporary file is to be processed by a print command, the command is responsible for deleting the temporary file.

**Note:** This option does not apply to CICS Client for Macintosh, because this client does not support print commands.

**/q** Disables the display of all messages output by the command.

***/s=servername or /r=servername***

Specifies the name of the server that the printer is to be connected to. This servername must correspond to an entry in the client initialization file. You can specify `/s`, or `/r`, but not both.

If neither parameter is specified, the first server entry in the initialization file is used.

If the parameter is specified as `/s` or `/r` (that is, no servername is provided) then, if the initialization file identifies more than one potential server to which the client can connect, the user is prompted to select from a list of available servers. These prompts are generated even if the `/q` parameter is specified.

If there is only one potential server identified in the initialization file, that server is used and the user is not prompted.

***/t=initialtransid***

Identifies the initial transaction to be invoked for this printer. If this option is omitted, any initial transaction specified in the initialization file is run. The string may be up to 128 characters long, specifying both a transaction name, and parameters to be passed to the transaction. The transaction name is the first four characters or the characters up to the first blank in the string. The rest of the string is the parameter data.

If the parameter is specified as `/t=` (that is, the `initialtransid` is omitted), any initial transaction specified in the initialization file is ignored.

**Note:** Be careful that transactions that you specify either here or in the client initialization file do not require terminal input to complete.

This option is case-sensitive.

**/w** Prompts the user, before the command completes, to press the Enter key, to confirm that messages output to the screen (both informational and error) have been read.

**Note:** This option is ignored for CICS Client for Windows Family and CICS Client for Macintosh.

## The CICSPRNT command

**/?** Causes the parameter syntax to be listed; any other options specified are ignored.

### Special considerations for using CICSPRNT with a CICS for OS/2 server

When using CICSPRNT to start a 3270 print terminal emulator for CICS for OS/2 Version 2.0.1, some special configuration is required. In this case, the CICS for OS/2 user exit 21 (TCS autoinstall) is required to guarantee that the Remote System name does not vary during client autoinstall.

**Note:** This is not required in CICS for OS/2 Version 3.0, as you can use CICSPRNT with both the /m= and /n parameters to autoinstall a specific printer-name.

#### User exit 21

Within user exit 21 of CICS for OS/2 you define the RemoteApplid you expect to receive from a CICS clients autoinstall request, and the corresponding RemoteSystemID you want the client to use. The following is an example in the C language:

##### User Exit 21 Assignment

```
if (strnicmp(pParms->Exp21RemoteApplid,"Prt1TCP",7) == 0)
{
    strcpy(pParms ->Exp21RemoteSystemId,"P1IP");
}
```

#### Notes:

1. **RemoteApplid** must match the **Client=applid** parameter in the client initialization file. The applid in this example is **Prt1TCP**.
2. **RemoteSystemId** must match the **Remote System** defined in the CICS for OS/2 TCT. In this example, **P1IP** is used.

For more information about user exit 21, refer to the *CICS for OS/2 Customization* book.

#### CICS for OS/2 definitions

Figure 33 on page 195 shows the TCT definition required on the CICS for OS/2 Version 2.0.1 server.

## The CICSPRNT command

Update	Add	View	Delete	Exit	Help	
FAATCT2		Terminal Control Table-1			More :	+
Terminal Name . . . . . : T1IP						
Group Name . . . . . : ALSKIX						
Network Name . . . . . : CICSV123						
Terminal Type . . . . . : P (V=3270 terminal, J=3270J terminal P=3270 printer, Q=3270J printer S=Sequential, A=3270 3151-PC)						
Model . . . . . : N (Y or N)						
Associated Printer . . . . . :						
Printer Close Mode . . . . . : (T=end of task F=end of file, or space)						
Initial Transaction Required : N (Y or N)						
Remote System . . . . . : <b>P1IP</b>						
Remote Terminal Name . . . . . :						
Description . . . . . : Client Printer via User Exit 21						
Enter F1=Help F3=Exit F8=Fwd F10=Actions F12=Cancel						

Figure 33. Client printer TCT definition: CICS for OS/2 Version 2.0.1

Where:

- Terminal Name** Must match the name on the CICSPRNT /n=xxxx command
- Terminal Type** Set to P for printer (Q for a DBCS printer)
- Remote System** Must match the RemoteSystemID parameter in user exit 21
- Remote Terminal Name** If left blank, this field assumes the Terminal Name entry. (in this example, T1IP).
- Autoconnect** On page 2 of the TCT you must specify Autoconnect=No.

For more information about resource definition in CICS for OS/2, refer to the *CICS for OS/2 Customization* book.

### Client initialization file definitions

In the client initialization file, the applid on the Client parameter must match the RemoteApplid specified in user exit 21. For example:

```
Client = Prt1TCP
```

## The CICSPRNT command

### CICSPRNT command

To start the printer emulator for the example configuration defined in this section, you would enter the following command:

```
CICSPRNT /s=CICSOS2 /n=T1IP /f=c:\print.fil
```

Where:

<b>s=CICSOS2</b>	The name of the server
<b>n=T1IP</b>	Matches the terminal name as defined in the TCT (see Figure 33 on page 195).
<b>f=print.fil</b>	Specifies print.fil as the file to which print requests are appended.

### Matching definitions

The following table summarizes the printer definitions that must match.

cicscli.ini	User Exit 21	CICS for OS/2	CICSPRNT	Example
Client=applid	RemoteApplid			Prt1TCP
	RemoteSystemID	Remote System		P1IP
		Terminal Name	Netname	T1IP

### Multiple printers

For multiple printers on a CICS for OS/2 server, you must have one CICS for OS/2 TCT definition for each printer you want to install. However, you may want to have multiple client printers, but do not want to define multiple TCT entries. For this purpose, you can use user exit 22 (Terminal Definition Autoinstall). By specifying a modelname rather than a netname on the CICSPRNT command, you can select a model within user exit 22 to match a model on the CICS for OS/2 server. Therefore you can predefine the remote terminal name and the remote system name of the printer.

For more information, refer to the *CICS for OS/2 Customization* book.

## The CICSTERP command (CICS Client for DOS only)

---

### The CICSTERP command (CICS Client for DOS only)

The CICSTERP command of CICS Client for DOS provides a dual 3270 screen terminal emulator and 3270 printer terminal emulator. CICSTERP combines the functions provided by the CICSTERM and CICSPRNT commands, which are available separately. You can start an emulator session, specify terminal emulator characteristics, and the names of the keyboard mapping and color mapping files.

The CICSTERP command detects whether the hardware on which the client is running is enabled for double-byte character set (DBCS) display. If it is, the emulator can display DBCS characters.

**Note:** Some uses of servers and protocols require a model terminal definition for the emulator that explicitly specifies that the client wants to display DBCS.

### Using CICSTERP

You use the CICSTERP command to:

- Start a 3270 terminal and print terminal emulator (/s or /r parameter)
- Specify the initial transaction (/t parameter)
- Specify the name of the keyboard mapping file (/k parameter)
- Specify the name of the color mapping file (/c parameter)
- Define the 3270 terminal emulator characteristics (/n and /m parameters)
- Define the 3270 printer emulator characteristics (/l and /o parameters)
- Determine the print file processing (/p parameter)
- Specify a file to which print files are appended (/f parameter)

You issue the CICSTERP command *once* with all the parameters you require.

The following is an example of a CICSTERP command:

```
CICSTERP /s=CICS0S2 /t=CESN /k=mykeys.ini /c=mycols.ini  
/n=cicsv123 /f=clprint.txt /q
```

In this example:

**/s=CICS0S2**

Specifies that a 3270 terminal emulator is started for the server CICS0S2.

**/t=CESN**

Specifies that the initial transaction is CESN.

**/k=mykeys.ini**

Specifies that the keyboard mapping file is named as mykeys.ini.

**/c=mycols.ini**

Specifies that the color mapping file is named as mycols.ini.

**/n=cicsv123**

Specifies that the 3270 terminal emulator characteristics are defined by the terminal definition cicsv123.

## The CICSTERP command (CICS Client for DOS only)

### ***f=clprint.txt***

Specifies that the print file will be appended to the file clprint.txt.

### ***/q***

Specifies that the display of messages output by the command is disabled.

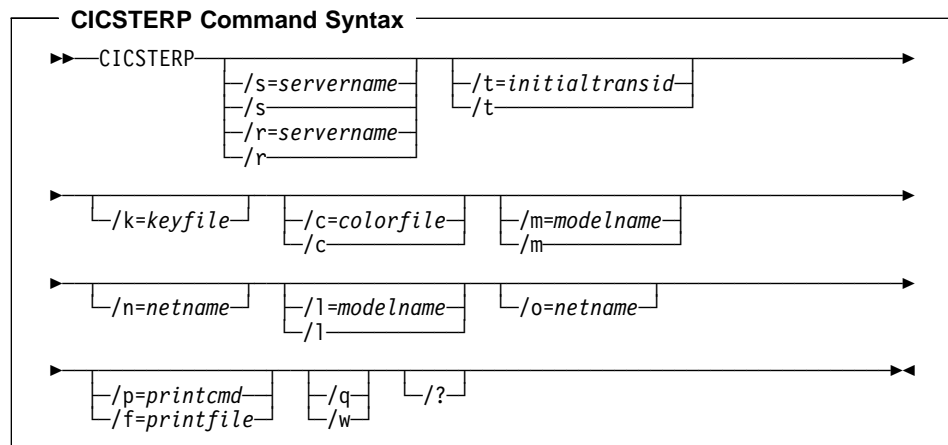
All parameters of CICSTERP are optional. That is, you can enter the CICSTERP command without any parameters, and defaults are taken from the client initialization file. Full details of the parameters are given in "CICSTERP command reference."

## Stopping a terminal emulator

To stop a terminal emulator, enter the string specified by TerminalExit in the client initialization file. This is EXIT by default.

## CICSTERP command reference

For an explanation of syntax diagrams, see "Command syntax" on page xvii.



The options are:

***/c=colorfile*** Identifies the name of a color mapping file (see "Customizing the screen colors" on page 161) to be used with the emulator. If this parameter is omitted, the environment variable CICSCOL is assumed to identify the color mapping file. If CICSCOL is not defined, a filename of CICSCOL.INI in the current directory is assumed.

If the parameter is specified as /c=, (that is, the color mapping filename is omitted), the emulator runs without any color definitions.

***/f=printfile*** Specifies the name of a file to which the output of print requests is appended. If the name of the file contains embedded blanks, it must be surrounded by double quotes (""). Any double quotes within the name of the file must be entered as backslash double quote (\").



## The CICSTERP command (CICS Client for DOS only)

If neither of the /f or /p parameters is provided, the PrintCommand or PrintFile parameter in the client initialization file defines the command, file, or default action to take with print requests.

**/k=keyfile** Identifies the name of a keyboard mapping file (see “Keyboard mapping file syntax” on page 155) to be used with the emulator. If this parameter is omitted, the environment variable CICSKEY is assumed to identify the key mapping file. If CICSKEY is not defined, a filename of CICSKEY.INI in the current directory is assumed.

**/m=modelname**

Specifies the name of a model terminal definition, as known at the server to which the screen terminal emulator is to connect, to be used to define the terminal characteristics. If neither this parameter nor /n=netname is specified, any ModelTerm value from the client initialization file is used. If no ModelTerm value has been specified in the initialization file, the server's default terminal definition is assumed.

If the parameter is specified as /m= (that is, the modelname is omitted), any ModelTerm value specified in the initialization file is ignored, and the server's default terminal definition is assumed.

This option is case-sensitive.

**/n=netname**

Specifies the name of a particular terminal definition at the server that this screen terminal emulator is to be installed as. The precise interpretation of netname varies between servers, for example, on CICS for OS/2 it references a termid defined in the CICS tables, on CICS for AIX it is a netname.

This option is case-sensitive.

**/l=modelname**

Specifies the name of a model terminal definition, as known at the server to which the printer terminal emulator is to connect, to be used to define the terminal characteristics.

This option is case-sensitive.

**/o=netname**

Specifies the name of a particular terminal definition at the server that this printer terminal emulator is to be installed as. The precise interpretation of netname varies between servers, for example, on CICS for OS/2 it references a termid defined in the CICS tables, on CICS for AIX it is a netname.

This option is case-sensitive.

**/p=printcmd**

Specifies an operating system command used to process the temporary print file generated when print requests are received by the terminal emulator. If the command contains embedded blanks, then the command

## The CICSTERP command (CICS Client for DOS only)

must be surrounded by double quotes (""). Any double quotes within the command must be entered as backslash double quote (\").

If neither of the /f or /p parameters is specified, the PrintCommand or PrintFile parameter in the client initialization file defines the command, file, or default action to take with print requests.

The temporary print file is post-processed by appending the filename to the command, and executing the resultant command. Thus print output may simply be copied to a local printer, copied into a permanent file, processed further for inclusion into a document, and so on. If the temporary file is to be processed by a print command, the command is responsible for deleting the temporary file.

**/q** Disables the display of all messages output by the command.

**/s=servername or /r=servername**

Specifies the name of the server that the terminal emulator is to be connected to. This servername must correspond to an entry in the client initialization file. You can specify /s, or /r, but not both.

If neither parameter is specified, the first server entry in the initialization file is used.

If the parameter is specified as /s or /r (that is, no servername is provided) then, if the initialization file identifies more than one potential server to which the client can connect, the user is prompted to select from a list of available servers. These prompts are generated even if the /q parameter is specified.

If there is only one potential server identified in the initialization file, that server is used and the user is not prompted.

**/t=initialtransid**

Identifies the initial transaction to be invoked for this terminal. If this option is omitted, any initial transaction specified in the client initialization file is run (this applies to screen terminal emulators only). The string may be up to 128 characters long, specifying both a transaction name, and parameters to be passed to the transaction. The transaction name is the first four characters or the characters up to the first blank in the string. The rest of the string is the parameter data.

If the parameter is specified as /t= (that is, the initialtransid is omitted), any initial transaction specified in the initialization file is ignored.

This option is case-sensitive.

**Note:** Be careful that transactions that you specify either here or in the client initialization file do not require terminal input to complete.

**/w** Prompts the user, before the command completes, to press the Enter key, to confirm that messages output to the screen (both informational and error) have been read.

**/?** Causes the parameter syntax to be listed; any other options specified are ignored.

## Font selection on terminal emulators

### Emulator status line

For CICSTERP, the emulator status line contains the following:

```
1B ssss tttt
```

where *ssss* is the screen terminal termid and *tttt* is the printer terminal termid.

### Printing errors

If DOS is unable to write to the print output device and displays a message with the options **Abort**, **Retry**, **Ignore**, **Fail** you should correct the fault and select **Retry**, or select **Fail**. If you select **Abort**, CICSTERP terminates and the system is left in an undefined state. In this case, you may need to restart the CICS client machine.

---

## Font selection on terminal emulators

CICS Client for Windows, CICS Client for Windows 95, and CICS Client for Windows NT provide a means of selecting and sizing fonts on their terminal emulators.

The terminal emulators provide a menu bar with **File** and **Settings** menus.

The commands on the **File** menu are:

- Print** Prints the emulator screen. This has the same effect as pressing the Print Screen key.
- Exit** Stops the terminal emulator.

The commands on the **Settings** menu are:

- Font** Opens a standard Windows dialog box that allows you to select any of the fixed-pitch fonts installed on your system. Select a font, font style, and size, and then select **OK**. The terminal window is then resized according to your font selection.
- Autosize** Specifies that the size of TrueType fonts is adjusted according to the size of the terminal window. That is, when you maximize, minimize, or drag the borders to resize the window, the font is resized to match the new window size. This command has no effect if the current font is not a TrueType font.
- Save on Exit** Specifies that the current font and terminal window position are saved when you close the terminal window. When you select **Save on Exit** the settings are saved in the CICSTERM.INI file, in the following directory:

Client platform	Directory
Windows NT	c:\winnt35
Windows 95	c:\windows
WIN-OS2	c:\os2\mdos\winos2

## Telnet terminal support

**Windows 3.1**            *d:\cicscli\bin*  
where *d* is the drive where the CICS Client  
is installed.

The CICSTERM.INI file is not erased when you delete a CICS Client installation. Therefore, when you re-install the Client, the settings from the old CICSTERM.INI file are used by the emulator.

CICSTERM.INI is initially installed in the \cicscli\bin directory

---

## CICS Client telnet terminal support

Support is provided for multiple tn3270 terminals to connect to CICS servers via a single CICS client. Telnet terminal support is provided with CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT. This function is available for all CICS servers that support the EPI.

You must first start a CICS telnet daemon by using the following command:

```
CICSTELD [/p=port] [/s=server] [/c=client codepage] [/l=server codepage] [/d=file]
```

where:

***/p=port***

Specifies the numeric Transmission Control Protocol (TCP) port number that cicsteld listens on for incoming telnet client requests. If the port number is not valid, cicsteld issues an explanation message. If you do not specify a port number, cicsteld assumes the default CICS port number of 1436.

***/s=server***

Specifies the applid of the CICS server.

***/c=client codepage***

For CICS Client for OS/2, specifies the codepage of the tn3270 client. The default codepage is 37 (EBCDIC US English).

***/l=server codepage***

For CICS Client for OS/2, specifies the codepage of the CICS server. The default codepage is 437 (ASCII US English).

***/d=file***

Enables trace and writes to the specified file.

***/t=transid***

Specifies an initial transaction.

***/m=model***

Specifies a model terminal name on the CICS server.

***/?*** Causes the parameter syntax to be listed; any other options specified are ignored.

When you have started the CICS telnet daemon, tn3270 terminals can then connect to the CICS server host.

## Telnet terminal support

You can use any Telnet 3270 client to access CICS through the CICS telnet daemon. To connect a tn3270 terminal, enter:

```
tn3270 hostname -p [port] -ext
```

where *hostname* is the hostname of the machine running the telnet Daemon, and *port* is the port number of the telnet daemon, if you are not using the default CICS port number. The `-ext` parameter enables extended datastream support. If extended datastream is not enabled you will get a blank screen. For more information, refer to the tn3270 documentation.

To stop the daemon, press the q key.

| You may experience problems if the number of Telnet 3270 clients connected to  
| CICSTELD exceeds the MAXTASKS setting of the CICS server. To prevent this  
| situation, use the CICSTELD parameter /n to limit the number of connections to  
| CICSTELD. For example, CICSTELD /n=10 will allow no more than 10 Telnet 3270  
| connections to CICSTELD. There is no default limit on the number of CICSTELD  
| users.

| CICSTELD works only with models that use the standard terminal size of 24x80. If you  
| use a model (specified with the /m parameter), you must ensure that it is of the correct  
| terminal size.

## Telnet terminal support

---

## Chapter 7. CICS client support for DCE

**This chapter describes**

- “CICS clients support for DCE”
- “Functions provided by the DCE support”
- “Remote procedure calls” on page 206
- “CICS Client for Windows NT considerations” on page 206
- “Coordinated security sign-on” on page 209

This chapter summarizes the requirements for use of Distributed Computing Environment (DCE) between CICS clients and CICS servers.

It is assumed that you are familiar with the principles of DCE. For general information about DCE, refer to the publication: *OSF Distributed Computing Environment: Understanding DCE* by Ward Rosenberry, David Kenny, and Gerry Kisher (published by O'Reilly and Associates, Inc., ISBN 1-56592-005-8).

---

### CICS clients support for DCE

Support for DCE is available for the following environments:

- CICS Client for Windows NT Version 2.0.2 running with:
  - Gradient PC-DCE for Windows NT/95 Version 2.0
  - IBM DCE for Windows NT Version 1.1.1
  - Digital DCE for Windows NT Version 1.1C
  - Transarc DCE for Windows NT Version 1.1C
- A CICS server that supports the DCE functionality of CICS Client for Windows NT.

The CICS client is installed in the normal way, no special action is required for the DCE support.

---

### Functions provided by the DCE support

Use of DCE provides the following functions not previously available with CICS Client for Windows NT:

1. Cell Directory Service (CDS).

This enables the CICS client to obtain its list of available CICS servers from the DCE Cell Directory, rather than relying on the client configuration file (CICSCLI.INI).

2. Coordinated security sign-on.

The user can sign on to DCE and be verified on their local machine. This sign-on context (the DCE principal) can then be propagated to the CICS server, avoiding

## CICS client support for DCE

the need to pass an explicit user ID and password, and avoiding the need to sign on again at the server.

### 3. Data encryption.

DCE provides the ability to encrypt the data flows between the client and server in a manner transparent to the application.

---

## Remote procedure calls

The communication protocol between the CICS client and server has been extended to operate via DCE Remote Procedure Calls (RPCs) in addition to TCP/IP sockets.

---

## CICS Client for Windows NT considerations

This section describes how the DCE support is implemented in CICS Client for Windows NT.

## Client changes for CDS support

### Client initialization file

There is one new entry in the **Client** section of the client initialization file:

```
Client = ...
  :
  [DceCellDirectory = Y | N]
  :
```

If `DceCellDirectory` is set to **Y**, the CDS services are used, provided DCE is installed and configured on the client machine. If set to **N**, CDS is not used. If omitted, this setting defaults to **Y**, if DCE is installed on the client machine, and to **N** if DCE is not installed. Thus, existing CICS client installations need no configuration changes to make use of the CDS.

This option is provided because searching the CDS for CICS servers may take some time, particularly with a large DCE cell. You can disable this search yet still have DCE installed on your client systems and still use DCE RPC to communicate with CICS servers.

### Servers located via the CDS

CICS servers located via the CDS appear to the client as if the following **Server** section parameters had been provided in the client initialization file:

<b>Server</b>	The 8-character region name from the cell directory.
<b>Description</b>	Description obtained from the cell directory annotation.



## CICS client support for DCE

<b>Protocol</b>	The name <b>RPC</b> . All servers located via the CDS will use RPC communication, using an RPC communications driver dynamic link library (DLL): <b>CCLGRARP</b> For Gradient DCE <b>CCLIBMRP</b> For IBM, Digital, or Transarc DCE
<b>Netname</b>	The 8-character region name from the cell directory. This is used by the RPC communication driver DLL to establish a connection with the server.
<b>UpperCaseSecurity</b>	The value <b>N</b> . CICS servers located via CDS would be CICS for AIX servers, where user IDs and passwords (if required) are always case-sensitive.

The following **Server** section parameters are not available for servers located via the CDS:

<b>ModelTerm</b>	The default model terminal for CICSTERM and CICSPRNT is not available. If a specific model is required, you must specify it with the <code>/M=model</code> parameter on the CICSTERM or CICSPRNT command.
<b>InitialTransid</b>	The default initial transaction for CICSTERM and CICSPRNT is not available. If an initial transaction is required, you must specify it with the <code>/T=transid</code> parameter on the CICSTERM or CICSPRNT command.

For more information on parameters in the client initialization file, refer to "Preparing the client initialization file" on page 140.

### List systems API calls

CICS clients provide two application programming interface (API) calls for listing available servers.

When a user application issues a `CICS_EciListSystems` or `CICS_EpiListSystems` call, the list of available CICS servers returned includes all the servers listed in **Server** sections of the client initialization file plus any servers that can be located using the CDS in the local DCE cell (assuming the CDS is enabled).

If only CDS-located servers are required, all **Server** sections in the client initialization file may be omitted.

Because the servers defined in the CDS can change as new servers are started, or existing servers are shut down, the client must query the CDS each time a `CICS_EciListSystems` or `CICS_EpiListSystems` call is made.

For more information on the API calls, refer to the *CICS Family: Client/Server Programming*, SC33-1435 book.

## CICS client support for DCE

### CICSTERM and CICSPRNT commands

When you issue the CICSTERM and CICSPRNT commands with the /s or /r parameter, they obtain their server lists via the CICS\_EpiListSystems call and therefore automatically list the servers in the client initialization file, as well as those additional servers located via the CDS.

### Client changes for RPC communications

The servers available for RPC communication can be located either via the CDS (see "Client changes for CDS support" on page 206) or directly by use of the client initialization file.

### Servers located via the CDS

If the CDS is used, nothing needs to be done; all the information the client needs to connect to the server is automatically obtained via the CDS.

### Client initialization file

If the client initialization file is used, the **Server** and **Driver** sections must specify the following parameters to use DCE RPC communication:

```
Server = ...
  Description = ...
  Protocol = RPC
  Netname = region name | ip address
  [Endpoint = 0 | RPC end-point port number]
  :
Driver = RPC
  DriverName = CCLGRARP | CCLIBMRP
```

<b>Protocol</b>	The Protocol parameter must correspond to a <b>Driver</b> section defining the RPC communications driver DLL. For Gradient DCE this driver is called CCLGRARP. For IBM, Digital, or Transarc DCE, this driver is called CCLIBMRP.
<b>Netname</b>	The Netname parameter must provide one of the following two items: <ol style="list-style-type: none"><li>1. The CICS server's 8-character region name, for example, CICSSRV1.</li><li>2. The CICS server's TCP/IP address in either text or numeric form, for example, cics1.hursley.ibm.com or 9.20.8.94.</li></ol>
<b>EndPoint</b>	This is an optional parameter and is only used if the Netname specifies a TCP/IP address rather than a CICS region name.  If present, and set to a non-zero value, it gives the TCP/IP port number associated with the CICS server's RPC end-point. If

## CICS client support for DCE

omitted or set to zero, the RPC endpoint mapper is used to automatically generate an appropriate end-point.

The EndPoint parameter is not normally required. However, if several CICS regions are running on the same machine, and therefore have the same TCP/IP address, this parameter is needed to distinguish between the CICS regions.

Other parameters in the **Server** section (such as ModelTerm or InitialTransid) are optional and can be included if required.

---

### Coordinated security sign-on

Using DCE RPC as the communication protocol between CICS client and CICS server allows “coordinated security sign-on.” This allows the user or client application to perform a single DCE login on the CICS client system, and for that login to be propagated to the CICS server where it can be used to authorize access to secure CICS resources. A separate CICS user ID and password is not required, nor is there any need to sign on to the CICS system.

DCE RPCs can be defined to run *unauthenticated* or *authenticated*, although the coordinated security sign-on is only available when using authenticated RPCs. To use authenticated RPCs requires suitable definitions to be made to the CICS server and requires the CICS client to be correctly configured.

### Unauthenticated RPC

If the CICS client has not been configured for authenticated RPC (see “Configuring the CICS client for authentication” on page 210), or the server definitions specify no security, all RPC communications between the client and server run unauthenticated.

When running unauthenticated, the CICS server may not know and certainly cannot trust the identification of the client; for this reason the coordinated security sign-on is not possible when using unauthenticated RPCs. In this situation access to secure CICS resources requires a separate CICS sign-on in the normal manner, using a valid CICS user ID and password.

This is identical to the security required when connecting the client and server via TCP/IP.

### Authenticated RPC

If the server definitions specify a suitable level of RPC security, and the client has been correctly configured (see “Configuring the CICS client for authentication” on page 210), all RPC communications between the client and server will run authenticated.

When running authenticated, the CICS server can obtain the DCE login principal of the originating client user or client application, in addition it can trust this principal and knows it can only have come from a valid DCE login on a valid CICS client system.

## CICS client support for DCE

In this situation the server can map the DCE principal to a corresponding CICS user ID and automatically sign on the CICS user. No separate CICS user ID and password are required from the user and no CICS sign-on step (using the CESN transaction, for example) is needed.

### Configuring the CICS client for authentication

Before the CICS client can participate in authenticated RPC with a server it must be correctly configured. If this configuration is not done, the client can only make unauthenticated RPCs and cannot therefore use the coordinated sign-on features.

To configure the client for authenticated RPC, run the CCLAUTH utility program, provided with the CICS client.

```
CCLAUTH /U=adminuserid /P=adminpasswd [/Q] [/W]
```

You must supply the CCLAUTH program with the DCE cell administrator user ID and password using the /U= and /P= parameters, because it needs to update the DCE registry with details of the client system.

The CCLAUTH program need only be run once on each CICS client workstation, although it is harmless if run multiple times.

### Obtaining the DCE principal

To enable the client user or client applications to change the DCE login if they receive or detect security errors, the DCE principal that is propagated to the CICS server on the authenticated RPC is obtained at the following times:

- For **CICSTERM** and **CICSPRNT**.

When the emulator starts, before it sends its terminal install request to the server.

You must perform a `dce_login` command to log in to DCE before starting the emulator.

- For **external call interface (ECI)** applications

At the start of each new logical unit of work.

An ECI application can use the DCE `sec_login` APIs to change the current principal, if it is necessary.

- For **external presentation interface (EPI)** applications

At each call to `CICS_EpiAddTerminal`, at each call to `CICS_EpiStartTran`, and before starting any ATI transactions.

An EPI application can use the DCE `sec_login` API calls to change the current principal, if it is necessary.

For more information on the ECI and EPI, refer to the *CICS Family: Client/Server Programming*, SC33-1435 book.

## CICS client support for DCE

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### Data encryption

By changing to an RPC protocol between the client and server, data encryption is handled entirely by DCE, although the function may not be available for the current levels of DCE on all platforms.

No client or server changes are required.

## **CICS client support for DCE**

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## Chapter 8. Problem determination

**This chapter discusses problem determination**

- “Preliminary checks and information”
- “Program support” on page 214
- “CICS client problem determination” on page 220
- “CICS server problem determination” on page 227
- “Communication problem determination” on page 228
- “Troubleshooting” on page 232

This chapter is an introduction to the process of problem determination in CICS client environments.

Problem determination involves starting with a symptom (or a set of symptoms) and tracing it back to its cause, to allow resolution of the problem. This chapter therefore discusses facilities for collecting information that will help you and your service organization solve the problem. The chapter concentrates on problem determination of CICS clients themselves. It also gives pointers to tools that are used in problem determination of communication products.

---

### Preliminary checks and information

Before you begin the problem determination process, consider the following questions to see whether there is an obvious cause of the problem.

- Are there any messages explaining the failure (on the CICS client workstation, CICS server, or both)?
- Has the connection run successfully before?
- Are specific parts of the network affected by the problem?
- Can you reproduce the error?

As you go through the questions, take note of anything relevant to the problem. Even if your observations do not at first suggest a cause, they may be useful in a detailed problem determination exercise.

## Program Support

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### Program support

If you need to contact your support organization, you should first refer to the Service and Support card supplied with the product for details of the support available to you.

This section provides guidance on reporting problems, detailing the information you should collect to assist your support organization. It also explains how the problem is handled through to resolution and the provision of a fix.

### Reporting problems

Before reporting your problem to the support organization try to ensure that the error is actually occurring within your CICS clients system, even if you are unsure whether the problem is due to CICS clients itself.

In practice, many errors reported to support organizations turn out to be user errors, or they cannot be reproduced, indicating just how difficult it can be to determine the precise cause of a problem. User errors are mainly caused by faults in application programs or by errors in setting up systems.

The ability of the support organization to resolve your problem quickly is dependent on the quality of the information you provide to them in relation to the problem. For this reason it is good practice to collect and organize problem data before making the initial contact.

Summarize your problem and the documentation/information you collect on a problem reporting sheet, ideally using the suggested structure and headings shown in Figure 34 on page 216. This sheet provides a valuable summary to the support organization, and a copy will be useful for your own records.

Although you are unlikely to have all of the data listed in the sheet when you first contact the support organization, you should be able to describe the symptoms of your problem and supply details of your system configuration (see "Documentation of problems" on page 215 for details).

### Level-1 support

If this is your first contact regarding this problem a unique incident number will be assigned. A Problem Management Record (PMR) is opened on the RETAIN database system, where all activity associated with your problem is recorded. The PMR remains "open" until it is solved.

Make a note of the incident number on your copy of the problem reporting sheet. You will be expected to quote the incident number in all future correspondence relating to this problem.

Your initial communication with the support organization is through a Level-1 representative, who uses the keywords that you have provided to search the RETAIN database for problems with similar symptoms. If your problem is found to be one already known to the support organization, and a fix has been devised for it, you will be advised of the availability of corrective service software that you can install to overcome



## Program Support

the problem, as described in “Obtaining the fix” on page 219. If the RETAIN search is unsuccessful, the problem is passed on to a Level-2 representative who will contact you for more information about your problem, to start a more detailed investigation of the cause.

### Level-2 support

Let the Level-2 representative know if any of the following events occurred before the problem appeared:

1. Changes in level of CICS clients, compiler or associated licensed programs
2. Corrective service software and fixes applied to workstation software
3. Problem Tracking Fixes (PTFs) applied to other associated products
4. Additional features used
5. Application programs changed
6. Unusual operator action.

At this stage you may be asked to supply more details, such as your problem reporting sheet, or some of the documentation listed in it (see “Documentation of problems” for more details). If this happens, the PMR is updated to show any documentation you have submitted.

Based on the information you supply, the investigation then carried out can determine whether the cause of your problem is new to the support organization, or is already known.

If the problem is a valid new one, an APAR may be raised, to be dealt with by the CICS service team, as described in “APARs and fixes” on page 218. If, however, the problem is already known, and a fix has been developed, you can obtain it as described in “Obtaining the fix” on page 219.

## Documentation of problems

In a communication environment, where many clients may be connected to several servers, you must obtain information from both the client and the server sides.

To facilitate problem determination, try to reduce your environment to only one client workstation and one server to narrow down the range of possibilities that may cause the error.

Listed below are the sources of information likely to be needed by the support organization when tackling problem determination for CICS clients. The list is also summarized on the example problem reporting sheet (see Figure 34 on page 216), where it can be used as a checklist of the information you have available.

- A description of the problem and the circumstances under which it occurs, that is, what you were trying to do.
- An operating system dump, or, for CICS Client for Windows NT, Event logs

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<b>PROBLEM REPORTING SHEET</b>		
Date	Severity	Problem Number
Company name		Contact name
address		
telephone		
<b>System configuration—CICS Client</b>		
CICS Client Rel	COBOL compiler level	Operating System
Client service level	C compiler level	Communications prod.
Fixes applied?	PL/I compiler level	
<b>System configuration—CICS Server</b>		
CICS Server Rel	COBOL compiler level	Operating System
Server service level	C compiler level	Communications Prod.
Host CICS Rel	PL/I compiler level	Database Server
Fixes applied?		
<b>Problem/Enquiry</b>		
Abend/Trap	Incorrout	
Wait	Message	
Loop	Other	
Performance		
<b>Documentation available—CICS Client</b>		
CICSCLI.INI	Program output	Operating system dump
Message Logs	Application source	CICS Client dump
CICS Client Trace	Translator output	Testcases
Symptom string	Compiler output	User Env. variables
Comms product trace		
<b>Documentation available—CICS Server</b>		
Abend code	Program output	Operating system dump
Message Logs	Application source	CICS Server dump
CICS Server Trace	Translator output	Testcases
Symptom string	Compiler output	User Env. variables
Comms product trace		
<b>Actions</b>		
Date	Name	Activity
<b>Resolution</b>		
APAR	Fix	Other

Figure 34. Sample problem reporting sheet

- A dump file for both CICS Client and the server
- A trace file for both CICS Client and the server
- A trace for any communication product you were using
- Listings of relevant application programs.

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- A sample short program that demonstrates the problem.
- CICS clients and Server message logs wherever possible. These contain information that is often overlooked.
- A list of APARs applied to the system.
- Installation and customization parameters in effect at time of failure (for example, the client initialization file or the .NDF file of Communications Server).
- Details of any user environment variables and hardware configurations.
- Operating Systems, compiler and other application release levels.
- A list of all the information you are providing, and the form in which it is being provided.

### Locating and compiling information

The advice listed below will help you compile the information required. If you are in any doubt about how to gather any of the items listed above, wait until you can seek advice from your support organization.

- Try to establish which program in your system seems to be the cause of the problem. As you are reading this book, it is likely that you already believe CICS clients to be the problem source.

You also need to provide the version and release number, for example Ver 2 Rel 0 Mod 4, together with the service level, for example Version 2.0.4, Current service level: UNnnnnn (where *nnnnn* is a valid PTF number provided with the service fix). With CICS clients, you can find the current version and service level by selecting **Details** in the Installation and Maintenance Utility. You then select **Product status** and the **Service level** button.

- Obtain OS/2 operating system details by using the SYSLEVEL command at a command prompt. It is often useful to redirect this information to a file and print it as part of your problem documentation. For example, to output to a file SYSTEM.LEV, enter `SYSLEVEL > SYSTEM.LEV`.

Obtain Windows NT operating system details by using the WINVER.EXE command at a command prompt.

If you are using SNA Server, you can find its version number by entering the SNAVER.EXE command.

- You should find details of your compiler level on the product diskette labels or the associated documentation. Alternatively, check the panel displayed on the screen at compile time.
- Give the problem a severity level. Severity levels have the following meanings:
  - Severity level 1 indicates that you are unable to use a program, resulting in a critical condition that needs immediate attention.
  - Severity level 2 indicates that you are able to use the program, but that operation is severely restricted.

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- Severity level 3 indicates that you are able to use the program, with limited functions, but the problem is not critical to your overall operation.
- Severity level 4 indicates that you are able to use the program with the problem causing negligible hindrance.

When deciding the severity of the problem, take care to categorize it correctly, as the procedures followed by the support organization depend on the severity level supplied.

- Also, try to classify the error and give a brief description of the problem. Include keywords associated with the problem, such as ABEND, WAIT, LOOP, PERFORMANCE, INCORROUT, and MESSAGE, corresponding to the problem classification types used in the RETAIN database. Strings containing other keywords are also useful. These are not predefined, and might include such items as a message or message number, an abend code, any parameters known to be associated with the problem, or, for example, STARTUP, INITIALIZATION, or TRANSIENT DATA.
- Finally, you should include details of your address, relevant contact names, and details of the other products at your installation.

Keep a copy of the problem reporting sheet which summarizes all the information relevant to the problem, together with any available documentation such as dumps, traces and output from programs, translators and compilers.

## Submitting the documentation

If you are asked to provide documentation, it will help the support organization during their investigation if you adhere to the following rules when preparing it:

- Provide as much information as possible in softcopy format on diskette.
- Write any notes and documents in English.
- If you are asked to supply any additional trace output, provide an unformatted version, rather than the viewable output from the formatter.
- If you upload files to a mainframe system, do so in binary rather than ASCII format.

## APARs and fixes

Once a reported problem is confirmed as being both new and valid, An “authorized program analysis report” (APAR) is raised from the Problem Management Record (PMR) and becomes a permanent record describing your error, and in time, its solution. An APAR is the means of reporting to the appropriate product service team any problems you find with an IBM program.

### The APAR process

The first step in the APAR process is that a Level-2 representative from the support organization enters an APAR containing a description of your problem into the RETAIN system. If you have a means of getting round the problem, details of this are entered as well. Your name is also entered, so that your support organization knows who to

## Program Support

contact if the service team need to ask anything further about the APAR documentation.

At this stage, you are given an APAR number. This number is always associated with the APAR and its resolution and, if a code change is required, is associated with the fix as well.

The service team may ask for additional backup documentation, normally via the Level-2 representative. The specific documentation required will vary from problem to problem, and depends on what information has already been supplied during the PMR stage.

During the investigation, you can ask your support organization at any time about how your APAR is progressing, particularly if it is a problem of high severity.

### Obtaining the fix

When the service team has found a fix for your problem, you may be asked to test it on your system. If so, you may be sent a Program Temporary Fix (PTF) in the form of individual replacement modules. This is normally done through the Level-2 organization and feedback from your testing will be requested.

Each PTF may contain several APAR fixes. If an individual APAR fix within a PTF is found to be in error, it may still be advisable to apply the PTF, to obtain the other APAR fixes.

In time formal corrective service software is made available, which you can order through your support organization. Traditionally, corrective service software has been supplied on Corrective Service Diskettes (CSD) ordered by CSD number. It may now be supplied on CD-ROM or via the Internet.

Fixes for CICS Clients are available from the Personal Software Services Web page at: <http://ps.software.ibm.com/>.

Personal Software Services provides technical information and assistance for the Personal Systems Support Family (PSSF) of products, which includes CICS.

## CICS clients trace

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### CICS client problem determination

In a CICS client environment there are two sources of information for problem determination:

1. CICS client trace (including trace to memory)
2. CICS client error log, see "CICS client error processing" on page 226

### CICS clients trace

Client trace is a very useful problem determination tool for communication problems. You can use the trace functions to collect detailed information on the execution of a certain function or transaction. A trace can show you how the execution of a particular activity is affected by, for example, the execution of other tasks in a CICS system. Each trace entry has a time stamp attached to it, which provides information on the time taken to perform certain activities.

IBM CICS Clients provides two types of trace function:

1. **Client trace (CICSCLI /d)**

This produces an ASCII text trace file. The trace file's name and location are defined by the Tracefile parameter in the client initialization file. The default for this setting is to produce a file called CICSCLI.TRC in the current directory.

2. **Client trace to memory (CICSCLI /t)**

This writes trace records to an internal memory buffer, that can be dumped to a file using CICSCLI /z. Client trace to memory is faster, and therefore preferable where system performance is an issue. The CICS clients dump file is an ASCII text file and has the same format as the trace file. The trace file's name and location are defined by the Dumpfile parameter in the client initialization file. The default for this setting is to produce a file called CICSCLI.DMP in the current directory.

You can change the trace and dump file name and directory by editing the client initialization file (called CICSCLI.INI by default). You can also control whether additional ECI and EPI trace points are written to the trace. (This does not apply to CICS Client for DOS or CICS Client for Macintosh.) You must stop and restart the client for changes to take effect.

### Starting and stopping client trace

To start client trace, enter the CICSCLI command with the /d option (or click on the equivalent icon, if you have created one) for example:

```
CICSCLI /d=nnn
```

where *nnn* is optional, and is the maximum size in bytes of the data areas to be traced. (The default value is 64.)

**Note:** It is recommended that you set /d=1000 to ensure that all relevant data is included in the trace before sending it to your support organization.

## CICS clients trace

If you need to trace the client immediately from startup, you can specify the /s and /d parameters together in the same CICSCLI command. For example, the following command starts the connection to a CICS server with the name CICSTCP, enables the trace function, and sets the maximum data area size to be traced to 128 bytes:

```
CICSCLI /s=CICSTCP /d=128
```

To stop client trace, enter the CICSCLI command with the /o option (or click on the equivalent icon), for example:

```
CICSCLI /o
```

The trace is also automatically stopped if you stop the client by using the CICSCLI /x command.

**Note:** For CICS Client for Macintosh you start and stop client trace by using the **Start Trace** and **Stop Trace** buttons on the CICS Client for Macintosh Administration Utility (see “The CICS Client for Macintosh Administration Utility” on page 170).

## CICS clients trace

### Starting and stopping client trace to memory

To start client trace to memory, enter the CICSCLI command with the /t option (or click on the equivalent icon, if you have created one) for example:

```
CICSCLI /t=nnn
```

where *nnn* is optional, and is the maximum size in bytes of the data areas to be traced. (The default value is 64.)

**Note:** It is recommended that you set /t=1000 to ensure that all relevant data is included in the trace before sending it to your support organization.

If you need to trace the client immediately from startup, you can specify the /s and /t parameters together in the same CICSCLI command. For example, the following command starts the connection to a CICS server with the name CICSTCP, enables the trace to memory function, and sets the maximum data area size to be traced to 128 bytes:

```
CICSCLI /s=CICSTCP /t=128
```

To stop client trace to memory, enter the CICSCLI command with the /o option (or click on the equivalent icon), for example:

```
CICSCLI /o
```

The trace to memory is also automatically stopped if you stop the client by using the CICSCLI /x command.

### Dumping client trace to memory to a file

When client trace to memory is running, you can dump the records in the buffer to a file by entering:

```
CICSCLI /z
```

The buffer is cleared after dumping and tracing continues. The trace records are appended to the file if it already exists. The default name of the file is CICSCLI.DMP, and the file name can be defined using the DumpFile parameter in the client initialization file. The trace records in memory are also dumped to the file if CICS Client for OS/2 terminates abnormally.

You can dump the trace in memory to file when tracing is stopped by specifying the /o and /z parameters together:

```
CICSCLI /o /z
```



## CICS clients trace

### CICS clients trace analysis

The CICS clients trace and dump file record detailed information on all actions taken during the execution of a particular activity. You can use this information in your problem determination activities, and to help understand how the CICS clients perform a particular function, for example, establishing a connection to a CICS server.

If you cannot interpret the trace yourself, you should contact your support organization and forward the trace file.

Some sample traces are shown in "Sample CICS clients trace." Further samples are described in the *CICS Clients Unmasked* book.

### Format of trace entries

The entries in the clients trace file have the following format:

```
date time [number] trace message  
data
```

where:

*date*

The date the entry was written.

*time*

The time the entry was written.

*[number]*

A number to aid your support organization in the diagnosis of serious problems.

*trace message*

The trace message number and text. These trace messages are explained in *IBM CICS Clients Messages*.

*data*

Some trace entries include a dump of key data blocks in addition to the trace message.

**Sample CICS clients trace:** Figure 35 on page 224 shows the trace information recorded during the successful connection of a CICS Client for OS/2 to a CICS for OS/2 server using the NetBIOS protocol.

## CICS clients trace

```

02/08/95 12:52:45 [ 2047] CCL2039 **** CICS Client for OS/2 V2.0 Service Level 00 - Service Trace Begins ****
02/08/95 12:52:45 [ 2051] CCL2048 Maximum trace data size set to 64
02/08/95 12:52:45 [ 2031] CCL2023 Client Response (SessId=00000039, Slot=0, ReqRc=0, AppRc=0)
02/08/95 12:53:42 [ 2036] CCL2028 Server Start request (SessId=0000003A)
9747:0010 636963736E657462          cicsnetb          ....>...
02/08/95 12:53:42 [ 2060] CCL2045 Request directed to server "CICSNETB"
02/08/95 12:53:42 [ 3231] CCL3231 Comms Load request (Driver=CCLIBMNB)
02/08/95 12:53:42 [ 3253] CCL3233 Loading protocol driver (DLL=C:\CICSCLI\BIN\CCLIBMNB.DLL)
02/08/95 12:53:42 [ 3232] CCL3232 Comms Load completed (Driver=CCLIBMNB, DrvId=1, Rc=0)
02/08/95 12:53:43 [ 3235] CCL3249 Comms Open request (Server=CICSNETB, Driver=CCLIBMNB)
02/08/95 12:53:43 [ 4222] CCL4215 NetBIOS name added for adapter 0
007F:1F9B 43434C4F5332AB33 805A000080C352B06 CLOS2.3.Z..5+. ..<!.....].....
02/08/95 12:53:47 [ 3236] CCL3236 Comms Open completed (Server=CICSNETB, LinkId=1, Rc=0)
02/08/95 12:53:48 [ 2031] CCL2023 Client Response (SessId=0000003A, Slot=0, ReqRc=0, AppRc=0)
02/08/95 12:53:48 [ 4208] CCL4216 NetBIOS connection established for session 0/8
007F:134A 434943535F434943 5352455331202020 CICS_ CICSRES1 ....[.....
02/08/95 12:53:48 [ 2054] CCL2055 Connection with server established (LinkId=1)
02/08/95 12:53:48 [ 3239] CCL3251 Comms Allocate request (LinkId=1, Tran= "CCIN" )
02/08/95 12:53:48 [ 3240] CCL3238 Comms Allocate completed (LinkId=1, ConvId=1, Rc=0)
02/08/95 12:53:48 [ 3116] CCL3113 CCIN install request: ApplId="* " " Codepage=850
02/08/95 12:53:48 [ 3245] CCL3242 Comms Send request: Length=32 (ConvId=1)
007F:0CF8 002012FF0000000C 0101000000000002 . .....
007F:0D08 0000000003F8F5F0 0000000004010000 .....850.....
02/08/95 12:53:48 [ 3246] CCL3241 Comms Send completed (ConvId=1, Rc=0)
02/08/95 12:53:48 [ 3247] CCL3254 Comms Wait request (ConvId=1)
02/08/95 12:53:48 [ 4224] CCL4210 NetBIOS send data for session 0/8: Length=128
007F:1FF8 8132311400010000 81AB33805A000852 .21.....3.Z..R a.....a...]...
007F:2008 2020202020202020 2020202000000000 .....
007F:2018 0000000000000000 0000000000000000 .....
007F:2028 0000000000000000 0000000000000000 .....
02/08/95 12:53:48 [ 3248] CCL3243 Comms Wait completed (ConvId=1, Rc=0)
02/08/95 12:53:48 [ 4205] CCL4212 NetBIOS receive pdu for session 0/8: Type=0082
02/08/95 12:53:48 [ 4225] CCL4211 NetBIOS receive data for session 0/8: Length=127
007F:1386 00434C3031434943 53434C3031000000 .CL01CICSCL01... ..<.....<.....
007F:1396 0000000000000000 0000000000000000 .....
007F:13A6 0000000000000000 0000000000000000 .....
007F:13B6 0000000000000000 0000000000000000 .....
02/08/95 12:53:48 [ 2057] CCL2058 Incoming conversation data (ConvId=1)
02/08/95 12:53:48 [ 3249] CCL3244 Comms Receive request (ConvId=1)
02/08/95 12:53:49 [ 3255] CCL3256 Comms Receive completed (last): Length=29 (ConvId=1, Reason=0, Rc=0)
007F:1FF8 001D12FF0000000C 0102000000000001 .....
007F:2008 0000000001C3C9C3 E2C3D3F0F1 .....CICSCL01
02/08/95 12:53:49 [ 3117] CCL3114 CCIN install response: ApplId="CICSCL01", Codepage=, Rc=0
02/08/95 12:53:49 [ 3251] CCL3255 Comms Complete request (ConvId=1)
02/08/95 12:53:49 [ 3252] CCL3246 Comms Complete completed (ConvId=1, Rc=0)
02/08/95 12:53:49 [ 3241] CCL3252 Comms Deallocate request (ConvId=1)
02/08/95 12:53:49 [ 3242] CCL3239 Comms Deallocate completed (ConvId=1, Reason=0, Rc=0)
02/08/95 12:53:59 [ 2048] CCL2040 Service Trace Disable request (SessId=0000003B)
02/08/95 12:54:00 [ 2049] CCL2041 ***** CICS Client for OS/2 - Service Trace Ends *****

```

Figure 35. Sample CICS clients trace

### Message ID Explanation

- CCL2039** Start of trace message. The trace file is appended to each time a trace is started. You can delete the file when required. Check the date and time stamp to ensure that you are reading the correct trace.
- CCL2048** Maximum trace data size is at the default size of 64 bytes. You can modify this size by specifying the size value in the start command for the client trace (see "Starting and stopping client trace" on page 220).

## CICS clients trace

- CCL2045** CICSNETB is the name of the server as specified by the Server parameter in the client initialization file
- CCL3231** Shows the name of the protocol driver used for this session.
- CCL3233** Shows the pathname of the directory from where the protocol driver (CCLIBMNB) is used for all clients using IBM NetBIOS.
- CCL4215** The NetBIOS adapter number used for this connection.
- CCL4216** The name of the server to which a connection has been established. The name of the server is the Local System Appl ID specified in the SIT for CICS for OS/2
- CCL3251** The client sends a CCIN transaction to the server to install its connection definition on the server.
- CCL3238** Reply to message CCL3238, includes the conversation ID for this conversation.
- CCL3113** The client sends a CCIN transaction to the server with Appl ID set to \* to install its application. The Appl ID is specified in the client initialization file as Client=\*. This requests the server to dynamically generate an Appl ID that is unique within the CICS server system.
- CCL3114** This is the response to message CCL3114 with the dynamically generated Appl ID.
- CCL2041** End of trace message.

**Connecting to CICS on Open Systems using TCP/IP:** Figure 36 on page 226 shows trace information recorded when we tried to connect to a CICS on Open Systems server over TCP/IP using an invalid port number. The port number specified in the CICSCLI.INI file was not defined in the services file of the server. Hence, the connection could not be established.

## CICS client error processing

```

02/16/95 17:48:26 [2047] CCL2039 **** CICS Client for OS/2 - Service Trace Begins ****
02/16/95 17:48:26 [2051] CCL2048 Maximum trace data size set to 64
02/16/95 17:48:27 [2036] CCL2028 Server Start request (SessId=000001D1)
96A7:0010 6369637374637000          cicstcp.          .....
02/16/95 17:48:27 [2060] CCL2045 Request directed to server 'CICSTCP '
02/16/95 17:48:27 [3231] CCL3231 Comms Load request (Driver=CCLIBMIP)
02/16/95 17:48:27 [3253] CCL3233 Loading protocol driver (DLL=C:\CICSCLI\BIN\CCLIBMIP.DLL)
02/16/95 17:48:27 [3232] CCL3232 Comms Load completed (Driver=CCLIBMIP, DrvId=1, Rc=0)
02/16/95 17:48:27 [3235] CCL3249 Comms Open request (Server=CICSTCP, Driver=CCLIBMIP)
02/16/95 17:48:27 [4408] CCL4413 TCP/IP (to CICSTCP) address=9.113.36.78, port=1345, socket=59
02/16/95 17:48:27 [3236] CCL3236 Comms Open completed (Server=CICSTCP, LinkId=1, Rc=0)
02/16/95 17:48:27 [2031] CCL2023 Client Response (SessId=000001D1, Slot=0, ReqRc=0, AppRc=0)
02/16/95 17:48:27 [2055] CCL2056 Connection with server lost (LinkId=1)
02/16/95 17:48:27 [3237] CCL3250 Comms Close request (LinkId=1)
02/16/95 17:48:28 [3238] CCL3237 Comms Close completed (LinkId=1, Rc=0)
02/16/95 17:48:31 [2035] CCL2027 Server Status request (SessId=000001D3, Space=87)
02/16/95 17:48:31 [2031] CCL2023 Client Response (SessId=000001D3, Slot=0, ReqRc=0, AppRc=0)
96A7:0010 0100434943535443 5000005443504950 ..CICSTCP..TCPIP .....&....&.&
96A7:0020 005300006261796B 616C000000000000 .S..bayka|..... ..../,/%.....
96A7:0030 0000000000000000 0000000000000000 .....
96A7:0040 0000000000000000 0000000000000000 .....
02/16/95 17:48:37 [2048] CCL2040 Service Trace Disable request (SessId=000001D4)
02/16/95 17:48:37 [2049] CCL2041 **** CICS Client for OS/2 - Service Trace Ends ****

```

Figure 36. CICS clients trace: using an invalid port number

### Message ID Explanation

- CCL4413** Shows the port number used for this connection request.
- CCL2056** Contains the error indication. You must check your definitions in the SIT on the server, the client initialization file on the workstation, and the services file for the port number specified.  
You must provide a valid port number or use the default value.

## CICS client error processing

There are two categories of messages in IBM CICS Clients:

1. Messages displayed to the user
2. Errors written to the CICS clients error log and trace file.

The *IBM CICS Clients Messages* manual explains all of these messages.

### Error log messages

Any errors on the client workstation that are not caused by incorrect use of the API are written to the client error log.

The following figure shows a sample CICS clients error log.

```

02/16/95 14:41:53 [4650] CCL4612 No sessions established between local LU SJA2051I and partner LU USIBMSC.SCMCICSX
02/20/95 17:37:32 [4403] CCL4404 TCP/IP (to CICSTCP) unable to resolve name: Rc=2

```

Figure 37. Sample CICS clients error log

## CICS server problem determination

The error log is an ASCII text file that you can browse using a standard text editor. You can specify the name of the error log via the LogFile parameter in the client initialization file. The default name is CICSCLI.LOG in the current directory.

The error messages are explained in *IBM CICS Clients Messages*, and also the help text for all messages is provided in two ASCII text files in the \CICSCLIBIN subdirectory. You can view these using any standard text editor:

<b>CCLMSG.HLP</b>	Help for the end user messages, in the language you chose at installation time.
<b>CCLLOG.HLP</b>	Help for the trace and log messages. This is provided in English only.

Errors resulting from incorrect use of the APIs simply result in error return codes to the application. It is the responsibility of the application to notify the end user of the error and provide guidance on corrective actions.

### Pop-up messages

Errors generated from within the client process are displayed in a pop-up window. You must click on **OK** in the pop-up window before the client can continue processing. There may be times when you do not want messages (client error and security) to appear in pop-up windows; for example, if you leave a CICS client running unattended overnight. To disable the display of pop-up messages, enter the following command:

```
CICSCLI /n
```

When the display of pop-up messages is disabled, the messages are still written to the client error log. To re-enable the display of pop-up messages, enter the following command.

```
CICSCLI /e
```

You can specify the /n parameter together with the /s parameter. The display of pop-up messages is enabled by default.

---

## CICS server problem determination

The most important facilities for problem determination on CICS servers are:

- Traces
  - auxiliary
  - internal
- Dumps
- CICS message logs
- Statistics information
- Monitoring information
- Execution diagnostic facility (EDF)
- CICS-supplied transactions, CEBR and CECI
- Independent software vendor (ISV) tools

## Communication problems

Information about these facilities is given in the *Problem Determination* books for the individual products (see “CICS publications” on page xix). You may need to contact the server system administrator for more information, for example, about a CICS server error log.

The following shows the error message prefixes for CICS products:

<b>CCL</b>	CICS clients
<b>FAA</b>	CICS for OS/2 and CICS for Windows NT Version 2
<b>DFH</b>	Mainframe CICS
<b>ERZ</b>	CICS for AIX and CICS for Windows NT Version 3.0
<b>AEG</b>	CICS/400.

---

## Communication problem determination

Even a small telecommunications network is a very complex system in which all components depend on one another. If one component fails and presents incorrect information to the other components, the latter may fail even more severely than the former. Sometimes the failure may be considerably delayed, and the error indicator may be lost before the error is detected. Thus, it is sometimes very difficult to analyze a problem in the communication part of a system.

The CICS clients generate various messages associated with the use of the supported communication protocols and the associated products. Refer to *IBM CICS Clients Messages* for a list of these messages and their explanations.

The communication products themselves generate error messages. For details of these, and information on troubleshooting, you should refer to the documentation for the communication product. The following sections summarize useful commands and utilities for problem determination.

### NetBIOS-providing products

#### **LAN Support Program**

For information on error messages generated by LAN Support Program, see the *LAN Support Program User Guide*.

#### **Communications Manager/2**

For information on NetBIOS problems, see the *Communications Manager/2 Problem Determination Guide*.

### TCP/IP-providing products

#### **IBM TCP/IP for DOS, IBM TCP/IP for OS/2**

Both TCP/IP for DOS and TCP/IP for OS/2 provide utilities to help in problem determination when communication problems occur. For a detailed discussion of these

## Communication problems

utilities, and problem determination in a TCP/IP environment, refer to the *TCP/IP for MVS, VM, OS/2 and DOS Troubleshooting Guide*.

The utilities are:

<b>PING</b>	Sends an Internet Control Message Protocol (ICMP) message to a destination IP address or IP network and reports the response time if that destination can be reached. Use this command to determine whether you can reach a destination on an IP network. If the PING command completes successfully, you installed TCP/IP correctly.
<b>NETSTAT</b>	Helps you obtain information about your own IP interfaces, for example, to list IP addresses and TCP/IP routing tables in use at your workstation.
<b>IFCONFIG</b>	Initializes an IP interface at your workstation and allows you to query its status. This is helpful if you have to find out if an IP interface is active.
<b>ARP</b>	Displays the IP-to-hardware address mapping table at your workstation. You can manually add a hardware address to your ARP table, for instance if you lose connection to a router. <b>Note:</b> Be careful when updating the ARP table. Entering a wrong IP-to-hardware address pair results in communication errors.
<b>HOSTNAME</b>	Displays the IP address of your workstation
<b>NSLOOKUP</b>	Displays the default server name and IP address.

### APPC-providing products

This section describes problem determination in products involved in APPC communication.

#### VTAM Buffer Trace

You can use VTAM buffer tracing to record the flow of data between logical units in the CICS environment. The trace entries include the netname of the terminal (logical unit) to which they relate. For details on VTAM buffer tracing and other VTAM problem determination functions, see the appropriate manual in the VTAM library.

#### Communications Manager/2

The *Communications Manager/2 Problem Determination Guide*, explains the APPC return codes, and further information is given in the *Communications Manager/2 APPC Programming Guide and Reference*.

You can use the APING command to check the connection between CICS clients and CICS servers (see "The APING utility" on page 231).

**Communications Manager/2 trace:** Communications Manager/2 provides a broad range of problem determination functions covering different types of APIs, connections, and services. The trace selections for Communications Manager/2 include the following:

## Communication problems

<b>API</b>	Contains APIs supported by Communications Manager/2, for example, APPC or EHLLAPI.
<b>DLC</b>	Contains data link control (DLC) types that pass through Communications Manager/2. When Communications Manager/2 encounters DLC of the type you selected, it copies the data to a trace record. For example, if you select <i>IBMTRNET</i> from the DLC list, <i>IBMTRNET DLC</i> is traced every time it passes through Communications Manager/2.
<b>Events</b>	Contains functions that are performed within Communications Manager/2. When Communications Manager/2 encounters the event you selected, it copies the data to a trace record. For example, if you selected <i>APPC SNDRCV</i> from the events list, a trace record is written every time APPC sends or receives data through the network.

You can enable the APPC API trace by doing one of the following:

- Selecting APPC from the API column of the Problem Determination Aids—Trace Services window
- Using the CMTRACE command
- Specifying the APPC\_API parameter on the DEFINE\_TRACE common services verb

**Communications Manager/2 dumps:** The Communications Manager/2 dump service is a diagnostic tool that helps you identify the source of certain types of communication problems. You can use dump services to copy the data stored in a portion of memory being used by a communications component.

### NetWare for SAA products

For information see the *Novell Netware APPC Technical Reference*.

NetWare error log events are written to the SYSTEM.LOG file in the \SYS directory.

### APPC Networking Services for Windows

APPC Networking Services for Windows provides the following desktop programs to help in problem determination:

#### Check Connection APING

Verifies the connection between your CICS client and the CICS server (see “The APING utility” on page 231).

#### Test CPI-C

Uses CPI-C calls to test the communication logic between a program at the client workstation and a partner program at the CICS server.

**Trace** Traces line flows and CPI-C calls.

#### Display SNA Sense Data

Displays SNA sense data descriptions.



## Communication problems

### Advanced Operations

Provides a help function to view problem cause and suggested recovery for any error.

See the *APPC Networking Services for Windows User's Guide and Reference*.

### Client Access/400 products

See the *Setup* book for the product.

You can use the PCSHELP command to get help on error messages generated by Client Access/400, and the PCSLOG command for error messages logged.

### SNA Server

See the *Microsoft SNA Server Administration Guide* for information on diagnostic tools that you can use with SNA Server.

### SNA•ps

See the *SNA•ps APPC Programmer's Reference*.

Via the SNA•ps Admin application menu, the SNA•ps Gateway can start a line trace showing the SNA traffic across the line.

### The APING utility

In an APPC environment, you can use the APING utility to test a connection. APING exchanges data packets with a partner computer over APPC and times how long the data transfer takes. It can be used to get a first estimate of the session setup time between two computers and the throughput and turnaround time on that APPC session. You can use APING to determine whether a session can be set up between two computers and to display extensive error information if session allocation fails. APING consists of two transaction programs: APING, which runs on the client side, and APINGD, which runs on the server side.

## Other tools and utilities

Apart from the trace and dump functions described above, other diagnostic tools and techniques are available.

### First Failure Support Technology/2

First Failure Support Technology/2 (FFST/2) is a software problem diagnosis tool for OS/2 system software and applications. It is designed to facilitate the capture of problem diagnosis information when a problem occurs.

Unless you are an advanced user, your primary use of FFST/2 will be the system error log and the message log formatter. Refer to the *Communications Manager/2 Problem Determination Guide* for a complete description of the tasks you can perform with FFST/2.

## Troubleshooting

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### Troubleshooting

This section provides information to help you solve some common problems with CICS clients. The problems are discussed under the following headings:

- “Starting clients and terminals”
- “NetBIOS” on page 233
- “Problems with TCP/IP communication” on page 234
- “APPC communication problems” on page 235.

For information on error messages, refer to *IBM CICS Clients Messages*.

### Starting clients and terminals

The following are solutions to problems that can occur when starting clients and terminals:

#### **CICS Client for DOS fails to start**

CICS Client for DOS does not start if the terminate and stay resident (TSR) program CICSCTSR.EXE has not been run first. You must run CICSCTSR.EXE to enable the DOS transport layer, before you issue any client commands. You only need to run this program once, although no harm is done if you run it multiple times. The supplied batch file CICSDOESC.BAT, runs CICSCTSR and then starts the client automatically. You may therefore want to add the following statement to your AUTOEXEC.BAT file:

```
CALL CICSDOESC
```

so that the program is run automatically at startup.

#### **After running CICSCTSR, the ECI/EPI/3270 application still fails**

For CICS Client for DOS only, the client must be started before you can run any ECI, EPI, or terminal emulation application. Use the supplied CICSDOESC.BAT batch file to start up the DOS transport layer (CICSCTSR) and the CICS Client for DOS automatically.

#### **CICS Client for Macintosh: selecting CICS Client Admin fails to start the client**

You have probably not installed the Apple Shared Library Manager (ASLM), which is a prerequisite for CICS Client for Macintosh. The ASLM should be in the extensions folder.

#### **CICS Client for Macintosh: error CCL2067 failure loading shared library manager**

You have probably not installed the Apple Shared Library Manager (ASLM), which is a prerequisite for CICS Client for Macintosh. The ASLM should be in the extensions folder.

## Troubleshooting

### CICS for OS/2 server reports “transaction CCIN failed”

CCIN and CTIN are two transactions required on the CICS for OS/2 server to enable a CICS client (or another CICS for OS/2 server) to attach using TCP/IP. For TCP/IP support, either CICS for OS/2 Version 2.0.1, or CICS for OS/2 Version 2.0 with CSD4 are required. Although the two Versions are essentially identical, CCIN and CTIN must be defined in the program control table for Version 2.0. Both transactions call the same program—FAATPPCI.

### A CICSTERM request has gone to the wrong server

If you do not specify the */s=servername* option on the CICSTERM command, a CICSTERM request is issued against the first server listed in the client initialization file, even if it is not yet activated. The *servername* should be as specified by the Server parameter in the client initialization file.

## NetBIOS

The following are solutions to problems that can occur when communicating over NetBIOS:

### There are only a few NetBIOS resources when running the CICS Client for OS/2 and CICS for OS/2 server on the same workstation

The CICS for OS/2 server is probably using all of the NetBIOS resources for itself and leaving none for CICS Client for OS/2. To avoid restricting the number of commands and sessions, reduce the values of *n1*, *n2*, and *n3* in the \IBMLAN\IBMLAN.INI file, or PROTOCOL.INI file.

```
[networks]
net1 = netbeui$, 0, LM10, n1,n2,n3
```

However, if you are using the LAN services program, leave sufficient resources for the LAN server/requester. Also in IBMLAN.INI, the *wrkheuristics* entry should contain 0 at position #18

### The NetBIOS connection fails. The trace reports: CCL4217 NetBIOS command failed for conversation 0/0: Cmd=0090, Rc=0014

This is a general return code returned by NetBIOS. Check that:

- the **Maximum NetBIOS Systems** value is greater than 0 in the System Initialization Table for the CICS for OS/2 or CICS for Windows NT Version 2
- If using CICS for Windows NT Version 2 or CICS Client for Windows NT, you have configured your NetBIOS for the correct LAN type, for example, Novell or IBM. (The default is Novell.) See *CICS for Windows NT Version 2 Intercommunication* for more information.

## Troubleshooting

### **Message FAA5573W received from CICS for OS/2: NetBIOS Listener Name exists elsewhere on adapter 0**

If the application ID specified in the CICS for OS/2 System Initialization Table is not unique in the network, message FAA5573W is displayed during startup of CICS for OS/2. This usually happens if you use the default value (CICSOS2) for the application ID.

To solve this problem, select **Continue** in the CICS for OS/2 console window and change the application ID according to your standards. You must shut down and restart CICS for OS/2 for the changes to take effect.

## **Problems with TCP/IP communication**

The following are solutions to problems that can occur when communicating over TCP/IP:

### **CICS Client for Windows Family cannot load the TCP/IP protocol driver**

You have probably received message CCL3229E in a pop-up window and message CCL3247 in the CICSCLI.LOG error log file. These messages indicate you have probably specified the wrong device driver in the client initialization file. For all TCP/IP communication, CICS Client for Windows should use the CCLWINIP driver, and CICS Client for Windows 95 and CICS Client for Windows NT should use the CCLWNTIP driver. Any vendor offering a WINSOCK interface can use this TCP/IP driver.

### **CICS Client for OS/2: error CCL4401 TCP/IP not available**

For CICS Client for OS/2 ensure that TCP/IP is one of the protocols listed in the LAN Adapter and Protocol Support (LAPS) current configuration list. LAPS is part of Network Transport Services/2 (NTS/2). For more information, see the NTS/2 documentation.

### **Message CCL4404 TCP/IP (to 'CICSTCP') unable to resolve name: RC=2**

The CICS server, (in this example, CICSTCP) could not be resolved by the TCP/IP protocol driver. Ensure that your domain name server and router address information is correct, and that any names and IP addresses in the TCP/IP ETC\HOSTS file are correct.

### **The TCP/IP connection to a CICS for OS/2 server failed**

Check that:

- the **Maximum TCP/IP Systems** value is greater than zero in the SIT for the CICS for OS/2.
- both the client and server are using the same port number.

## Troubleshooting

- CCIN and CTIN have been defined on your CICS for OS/2 server. Refer to the CCIN problem in “Starting clients and terminals” on page 232 for more information.

### APPC communication problems

The following are solutions to problems that can occur when communicating over APPC:

#### **CCIN not recognized, CTIN not recognized**

The CCIN transaction installs your CICS clients definition on the CICS server. The CTIN transaction installs your client terminal definition on the CICS server. These transactions must be available on the CICS server if it supports the EPI, because the EPI implies CICS 3270 terminal emulation and CICS 3270 printer emulation. For information on which CICS servers support EPI and hence CICS 3270 emulation, see Table 2 on page 19. You can ignore these messages if your CICS server does not support the EPI.

#### **A CICSTERM command for a mainframe CICS server failed**

CICSTERM and CICSPRNT use CICS 3270 emulation. Most mainframe CICS servers do not support CICS 3270 emulation. For information on which CICS servers support CICS 3270 emulation, see Table 2 on page 19.

#### **Automatic transaction initiation against a CICS clients terminal does not work**

Different products provide different APPC implementations for handling inbound attaches. Therefore for CICS clients using IBM Communications Server, Communications Manager/2, APPC Networking Services for Windows, Microsoft SNA Server, and IBM Personal Communications, you must predefine the CRSR attach program to relay the information to the CICS clients. This is necessary to enable the CICS server to perform automatic transaction initiation (ATI) against the CICS clients terminals. (As long as the CICS server supports CICS 3270 terminal emulation, see Table 2 on page 19.)

For CICS clients therefore, you must define the inbound attach transaction CRSR as follows:

CICS Client for Windows 3.x using APPC Networking Services for Windows  
Define CRSR to use program CCLSNWTP.EXE. See “APPC Networking Services for Windows” on page 103.

CICS Client for Windows 3.x using Microsoft SNA Server  
Define CRSR to use program CCLSNSTP.EXE. See “Microsoft SNA Server” on page 110.

CICS Client for Windows 3.x using IBM Communications Server  
Define CRSR to use program CCLSNSTP.EXE. See “IBM Communications Server” on page 113.

## Troubleshooting

CICS Client for Windows 95 using IBM Communications Server  
Define CRSR to use program CCLCLNT.EXE. See "IBM Communications Server" on page 114.

CICS Client for Windows NT using IBM Communications Server  
Define CRSR to use program CCLCLNT.EXE. See "IBM Communications Server" on page 119.

CICS Client for Windows 95 using IBM Personal Communications  
Define CRSR to use program CCLCLNT.EXE. See "IBM Personal Communications" on page 115.

CICS Client for Windows NT using IBM Personal Communications  
Define CRSR to use program CCLCLNT.EXE. See "IBM Personal Communications" on page 121.

CICS Client for Windows Family using NetWare for SAA  
You do not need to define CRSR, because an exit is automatically driven when an inbound attach is received.

CICS Client for DOS using NetWare for SAA  
You do not need to define CRSR because the CICS Client for DOS automatically polls for any inbound attach requests.

CICS Client for Macintosh using SNA•ps  
Define CRSR as an inbound attach transaction.

**Note:** If you are using TCP62 on CICS Client for OS/2, CICS Client for Windows 95 or CICS Client for Windows NT, you do not need to define CRSR, as this is done automatically by the client.

### **APPC Networking Services for Windows hangs during startup**

APPC Networking Services for Windows may hang if your configuration requires a NODE ID and you have not specified a valid NODE ID in the NSD.INI file. The NODE ID must match that configured in VTAM, otherwise your workstation may be unresponsive after it attempts to connect to the CICS server.

### **Message "Adapter Not Present" displayed when starting APPC Networking Services for Windows**

This message may be obtained if you attempt to use APPC Networking Services for Windows with a token-ring network. You must configure your token-ring adapter before you can use APPC Networking Services for Windows.

### **Message FILE ERROR, CANNOT FIND NSWD.DDL displayed**

Your CICS Client for Windows has attempted to use APPC Networking Services for Windows, but APPC Networking Services for Windows has not been started. You must start APPC Networking Services for Windows before you start the CICS Client for Windows. You can start APPC Networking Services for Windows automatically by copying the **Autostart Networking Services** icon to the Startup group.

## Troubleshooting

### **APPC Networking Services for Windows: errors received when using Dependent LU**

APPC Networking Services for Windows Version 1.0 only supports independent logical units (ILUs). Therefore, your LU defined within VTAM must be an ILU and not a dependent LU (DLU).

### **APPC Networking Services for Windows does not work under WIN-OS/2**

APPC Networking Services for Windows does not run under WIN-OS/2 because it uses Windows functions that are not supported with WIN-OS/2 (as supplied with OS/2 Version 2.11).

## Troubleshooting



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### Chapter 9. Distributing CICS clients in a network

**This chapter discusses**

- “Configuration, distribution, installation”
- “Performing installation and maintenance.”

CICS Client for OS/2 and CICS Client for Windows Family are CID-enabled products, that is, they conform to IBM's configuration, installation, and distribution (CID) architecture. Such products can be automatically installed and maintained. Indeed, CICS Client for OS/2 can be tailored and automatically distributed to workstations on a LAN, without any action being required at those workstations.

---

#### Configuration, distribution, installation

The CID architecture is a set of standards that allows installation of software on workstations from code residing at a LAN server. This saves you the bothersome tasks of inserting diskettes and responding to prompts and messages at each client workstation. Installation can be *lightly attended*, meaning that entering the install command is all that is required at the workstation. The lightly attended installation process is described in this chapter.

For **CICS Client for OS/2** only, installation can also be *unattended*, meaning that you can automatically install CICS clients on many workstations without any end user action being required. This makes installation and maintenance of CICS clients much easier. Unattended CID is performed under the control of a *software distribution manager (SDM)*, which remotely installs the CID-enabled product. Examples of SDMs are NetView Distribution Manager (NVDM/2), Start/2, and SystemView for OS/2. Unattended CID is beyond the scope of this book; refer to the documentation for your SDM-providing product for a full description of unattended CID.

For both lightly attended and unattended CID, the installation and maintenance options are supplied in a *response file*. You invoke the installation program with parameters that identify the source and target directories, and the response file. The progress of the installation is recorded in an error log and history log. Return codes are notified to the software distribution manager.

---

#### Performing installation and maintenance

The procedure for lightly attended CID is as follows:

1. Copy the contents of the CICS clients diskettes to a local or LAN drive, for example:  

```
XCOPY a:\*.* /s /e
```
2. Edit the supplied response file CICSCLI.RSP or create a new response file. The supplied file CICSCLI.RSP can handle only install and delete actions.

## Performing installation and maintenance

3. Start the installation, by entering `INSTALL` together with the required parameters.  
For example:

```
INSTALL /A:I /R:F:\INSTCICS\CICSCLI.RSP
/S:F:\INSTCICS
/L1:F:\INSTCICS\CICSCLI.OUT
/L2:F:\INSTCICS\CICSCLI.HIS /X
```

In this example, the CICS client is installed from the redirected drive F: on the server, according to the options supplied in the response file `CICSCLI.RSP`. The response file specifies the drive and directory in which to install the client. Errors are logged in `CICSCLI.OUT` and the history log is contained in `CICSCLI.HIS`. The `/X` parameter specifies that the installation is noninteractive.

**Note:** The base level of the CICS client is installed using the `INSTALL` command, while corrective service software is installed using the `EPFINSTS` command.

4. The installation proceeds automatically.

## The installation and maintenance parameters

The installation and maintenance parameters are as follows:

```
INSTALL /A:action
/G:include-path
/L1:error-log
/L2:history-log
/P:"product-name"
/R:response-file
/S:source-location
/T:install-target-directory
/TU:update CONFIG.SYS directory
/X
```

**Note:** You can enter the parameters in any order. Equals signs (=) can be used instead of colons (:) in the parameters. Values can be uppercase or lowercase.

### **/A:action**

Specifies the action to be performed by the installation program. If you specify this parameter, the main window of the installation program is not displayed. Valid values for *action* are:

<b>D</b>	Delete an installed CICS client system
<b>I</b>	Install a new CICS client system
<b>R</b>	Restore a backed-up CICS client system
<b>U</b>	Update an installed CICS client system

These actions are the same as those provided by the installation utility (see for example, "Updating your CICS Client for OS/2 system" on page 42).

**Note:** The installation program is not supplied with corrective service diskettes. Therefore, if you are updating, restoring, or deleting a CICS client, you must have access to the installation program used to install the CICS client.

## Performing installation and maintenance

### ***/G:include-path***

Specifies the drive and path of a general response file to be included by the specific response file. For more information about response files, see “Response files” on page 242.

### ***/L1:error-log***

Specifies the drive, path, and file name of the error log file. The error log contains messages associated with installation, including confirmations and error messages. Messages are written to the error log even if you specify the */X* parameter.

You should specify the drive and path where the installation program is running. If you do not specify the */L1* parameter, no error log is maintained. If you specify an error log that already exists, it is appended to.

Example:

```
/L1:F:\CICSCLI\CICSCLI.LOG
```

### ***/L2:history-log***

Specifies the drive, path, and file name of the history log file. The history log contains an entry for each file transferred, each workplace shell object (OS/2) or Program Manager icon (Windows) created, and each Installation Exit run.

You should specify the drive and path where the installation program is running. If you do not specify the */L2* parameter, no history log is maintained. If you specify a history log that already exists, it is appended to.

Example:

```
/L2:F:\CICSCLI\CICSCLI.HIS
```

### ***/P:“product-name”***

Specifies the catalog name of the product to perform the action on.

### ***/R:response-file***

Specifies the drive, path, and file name of a response file, (see “Response files” on page 242).

Example:

```
/R:L:\CICSINS\CICSCLI.RSP
```

### ***/S:source location***

Specifies the drive and path containing the source files to be installed or updated.

### ***/T:install-target-directory***

Specifies the drive and path that CICS client files are installed into. If you specify this parameter, it overrides the *FILE* path specified in the response files.

### ***/TU:update target CONFIG.SYS directory***

Specifies the drive and path of the target *CONFIG.SYS* (OS/2) or *AUTOEXEC.BAT* (Windows and Windows 95) to be updated.

### ***/X*** Specifies that the installation is fully automatic.

When you specify this parameter, no progress indicator panel is shown and error messages are logged in the error log file. (You specify the path name of the error

## Performing installation and maintenance

log file using the /L1 parameter.) If you do not specify all of the information required for the action to complete, an error occurs.

If you do not specify the /X parameter, the user is prompted for any information that the installation program needs to complete the action. In this interactive mode of operation, progress indication is shown and error messages are displayed in secondary windows.

### Response files

A response file is an ASCII text file containing answers to the options that you select when you install or maintain a CICS client system. This allows installation and maintenance to be performed automatically, without interaction.

In a response file you can specify:

- Whether environment information should be updated automatically
- The CICS clients components to be installed
- The path for installation or maintenance
- Whether existing files should be overwritten
- Whether only backup versions of CICS clients should be deleted

The response file supplied with CICS Client for OS/2 is shown in Figure 38 on page 247. You can use such a response file to install or delete CICS clients. To perform other actions you must prepare your own response files using a suitable editor.

Normally, you will have only one response file, specified by the /R parameter of the installation program. However, you may sometimes need to install or update a CICS client on a workstation with different options. In this case you can use one response file as a general response file to be included in a specific response file. The specific response file would contain options specific to a particular workstation, and the general response file would contain options common to all workstations. For example, you might use a general response file and a specific response file to install a particular component on only certain workstations. You use the /R parameter to specify the specific response file, and the /G parameter to specify the location of the general response file.

### Response file keywords

The following keywords are supported in response files for CICS clients:

**CFGUPDATE** Specifies whether the installation program automatically updates the environment information in CONFIG.SYS (CICS Client for OS/2), or AUTOEXEC.BAT (CICS Client for Windows and CICS Client for Windows 95) or the Windows NT registry. Valid values for this keyword are:

**AUTO** Automatically updates the environment information

**MANUAL** Does not update the environment information

**Actions:** INSTALL, UPDATE, DELETE.

## Performing installation and maintenance

<b>COMP</b>	<p>Specifies the name of a component to perform an action on. Valid values are:</p> <ul style="list-style-type: none"><li>• CICS Client runtime system</li><li>• CICS Client programming samples</li><li>• CICS Client documentation</li></ul> <p>In addition, the following are valid for CICS Client for OS/2 and CICS Client for Windows NT:</p> <ul style="list-style-type: none"><li>• CICS Gateway for Java</li><li>• CICS Gateway for Lotus Notes</li><li>• CICS Internet Gateway</li></ul> <p>and the following is valid for CICS Client for Windows NT and CICS Client for Windows 95:</p> <ul style="list-style-type: none"><li>• CICS Host TCP/IP access feature</li></ul> <p>You do not need to enclose the component names within quotes. The name is not case-sensitive.</p> <p><b>Actions:</b> ALL actions.</p>
<b>DELETEBACKUP</b>	<p>Specifies whether to delete only the backup version of CICS client or the entire product. Valid values for this keyword are YES (delete backup version only) and NO (delete current version).</p> <p><b>Actions:</b> DELETE.</p>
<b>FILE</b>	<p>Specifies the drive and directory in which to install CICS client; for example, the C:\CICSCLI directory. This keyword applies to the installation action only.</p> <p><b>Actions:</b> INSTALL.</p>
<b>INCLUDE</b>	<p>Specifies which general response files to include with a specific response file. The format of this keyword is:</p> <p>INCLUDE = <i>filespec</i></p> <p>where <i>filespec</i> specifies the general response file to be included. If the file specification contains any global characters (* or ?), the first file found that matches the specification is included. If the specification is not valid, no general response file is included.</p> <p><b>Note:</b> You should not have more than five levels of included response files.</p> <p><b>Actions:</b> All actions.</p>
<b>OVERWRITE</b>	<p>Specifies whether to overwrite files automatically during installation. Valid values for this keyword are YES and NO.</p> <p><b>Actions:</b> INSTALL, UPDATE.</p>

## Performing installation and maintenance

<b>SAVEBACKUP</b>	<p>Specifies whether to save a backup version of the CICS client when it is updated. Valid values for this keyword are YES and NO.</p> <p><b>Actions:</b> UPDATE.</p>						
<b>CICSCLIINI</b>	<p>Specifies the name of a customized CICSCLI client initialization file. If no customized initialization file is to be provided, the value of the parameter must be set to an asterisk (*).</p> <p>Before the installation is started, the customized .INI file must be placed in (or below) the source directory from which the installation is taking place. The value of the parameter must specify the path relative to this source directory. The .INI file is copied to the \BIN subdirectory on the target, and the CICSCLI environment variable set in CONFIG.SYS (or AUTOEXEC.BAT or the Windows NT registry). Thus, if the customized file (MYCLI.INI) is placed in the subdirectory \MYFILES under the source directory, the value of the parameter would be CICSCLIINI = MYFILES\MYCLI.INI.</p> <p><b>Actions:</b> INSTALL.</p>						
<b>CICSCOLINI</b>	<p>Specifies the name of a customized CICSCOL color mapping file used to tailor the colors for the CICSTERM terminal emulator. If no customized mapping file is to be provided, the value of the parameter must be set to an asterisk (*).</p> <p>The customized file is copied into the \BIN subdirectory on the target system, and the CICSCOL environment variable set.</p> <p>See the CICSCLIINI keyword description for details of how to specify the file name, and where the customized file should be placed before installation.</p> <p><b>Actions:</b> INSTALL.</p>						
<b>CICSKEYINI</b>	<p>Specifies the name of a customized CICSKEY keyboard mapping file used to tailor the keys for the CICSTERM terminal emulator. If no customized mapping file is to be provided, the value of the parameter must be set to an asterisk (*).</p> <p>The customized file is copied into the \BIN subdirectory on the target system, and the CICSKEY environment variable set. See the CICSCLIINI keyword description for details of how to specify the file name, and where the customized file should be placed before installation.</p> <p><b>Actions:</b> INSTALL.</p>						
<b>MESSAGELANG</b>	<p>Specifies the language of messages sent to the CICS clients. Valid values are:</p> <table><tr><td><b>AA</b></td><td>Arabic</td></tr><tr><td><b>CN</b></td><td>Simplified Chinese</td></tr><tr><td><b>TW</b></td><td>Traditional Chinese</td></tr></table>	<b>AA</b>	Arabic	<b>CN</b>	Simplified Chinese	<b>TW</b>	Traditional Chinese
<b>AA</b>	Arabic						
<b>CN</b>	Simplified Chinese						
<b>TW</b>	Traditional Chinese						

## Performing installation and maintenance

<b>CZ</b>	Czech
<b>DK</b>	Danish
<b>FI</b>	Finnish
<b>FR</b>	French
<b>FR</b>	Canadian French
<b>DE</b>	German
<b>HU</b>	Hungarian
<b>IT</b>	Italian
<b>JP</b>	Japanese
<b>KR</b>	Korean
<b>NO</b>	Norwegian
<b>PL</b>	Polish
<b>BR</b>	Brazilian Portuguese
<b>PT</b>	Portuguese
<b>RU</b>	Russian
<b>ES</b>	Spanish
<b>SE</b>	Swedish
<b>TR</b>	Turkish
<b>US</b>	US English

**Actions:** INSTALL.

### **INSTALLTYPE**

Specifies whether CICS Client for Windows NT is to be installed as a common application (the program group is visible to all users and the client defaults to a common set of .INI and message files) or as a personal application (the program group is visible and available only to the installing user). If the installing user is not a member of the Administrators user group this option is ignored and CICS Client for Windows NT installed as a personal application. Valid values for this keyword are:

<b>C</b>	Installs CICS Client for Windows NT as a common application
<b>P</b>	Installs CICS Client for Windows NT as a personal application

**Actions:** INSTALL

### **REGISTERSERVICE**

Specifies whether CICS Client for Windows NT should be registered as a Windows NT service during installation. Valid values for this keyword are:

<b>YES</b>	Registers CICS Client for Windows NT as a Windows NT service
<b>NO</b>	Does not register CICS Client for Windows NT as a Windows NT service

## Performing installation and maintenance

### Response file structure

There are two kinds of line in a response file:

- **Comment lines**

Comment lines are either blank or start with an asterisk (\*) or a semicolon (;).

- **Response lines**

Response lines are used to determine the options and configurations to install on the target system.

Response lines have the following syntax:

```
keyword = value
```

Keyword-value pairs can be in any order. However, there can be only one pair per line.

You can enter keywords in uppercase or lowercase letters. You cannot include spaces within keywords.

The maximum line length in a response file is 255 characters.



## Performing installation and maintenance

### Response file sample

```
*****
*
* Customer Information Control System (CICS) Client for OS/2
*
*      33H2411 (C) COPYRIGHT IBM CORP 1994, 1995
* ALL RIGHTS RESERVED. LICENSED MATERIALS - PROPERTY OF IBM
*
*****
*
* This response file can be used to install or delete CICS Client for OS/2.
* Values supplied here over-ride values supplied in the .PKG files,
* (it is recommended you DO NOT alter the values in the .PKG files).
* Values supplied on the INSTALL command over-ride values supplied in
* this response file.
*
* CFGUPDATE specifies whether CONFIG.SYS is updated automatically,
* valid values are AUTO - automatically updates CONFIG.SYS
*                MANUAL - does not update CONFIG.SYS.
CFGUPDATE = AUTO
*
* COMP identifies the components of CICS Client for OS/2 that this
* Response file applies to.
COMP = CICS Client runtime system
COMP = CICS Client programming samples
COMP = CICS Gateway for Lotus Notes
COMP = CICS Internet Gateway
COMP = CICS Client documentation
*
* for Install only FILE provides the default path that CICS Client for OS/2 will be
* installed into.
FILE = C:\CICSLI
*
* OVERWRITE specifies whether to automatically overwrite files during
* installation, valid values are YES - overwrite files
*                NO - do not overwrite files.
OVERWRITE = YES
*
* DELETEBACKUP specifies during delete whether to delete only backup
* versions of CICS Client for OS/2. Valid values are:-
*                YES - delete backup version only
*                NO - delete current version
DELETEBACKUP = NO
*
```

Figure 38 (Part 1 of 3). Sample CICS clients response file - CICS Client for OS/2

## Performing installation and maintenance

```
*
* CICCLIINI specifies the name of a customized CICCLI initialization
* file. This value is only applicable during installation. If no customized
* initialization file is to be provided, then the value of the
* parameter must be set to an asterisk (*).
*
* Before the installation is started, the customized .INI file must be placed
* in (or below) the source directory from which the installation is taking
* place. The value of the parameter should specify the path relative to this
* source directory. The .INI file will be copied to the BIN subdirectory on
* the target, and the CICCLI environment variable set in CONFIG.SYS.
* Thus if the customized file (mycli.ini) has been placed in directory
* myfiles under the source directory, then the value of the parameter would
* be CICCLIINI = myfiles\mycli.ini.
*
CICCLIINI = *
*
*
* CICSCOLINI specifies the name of a customized CICSCOL initialization
* file used to tailor the colors for the CICSTERM terminal emulator.
* This value is only applicable during installation. If no customized
* initialization file is to be provided, then the value of the
* parameter must be set to an asterisk (*).
*
* The customized file is copied into the BIN subdirectory on the target
* system, and the CICSCOL environment variable set.
*
* See CICCLIINI for details of how to specify the filename, and where the
* customized file should be placed prior to installation.
*
CICSCOLINI = *
*
*
* CICSKEYINI specifies the name of a customized CICSKEY initialization
* file used to tailor the keys for the CICSTERM terminal emulator.
* This value is only applicable during installation. If no customized
* initialization file is to be provided, then the value of the
* parameter must be set to an asterisk (*).
*
* The customized file is copied into the BIN subdirectory on the target
* system, and the CICSKEY environment variable set.
*
* See CICCLIINI for details of how to specify the filename, and where the
* customized file should be placed prior to installation.
*
CICSKEYINI = *
```

Figure 38 (Part 2 of 3). Sample CICS clients response file - CICS Client for OS/2

## Performing installation and maintenance

```
*
*
* MESSAGELANG specifies the language in which messages sent to the user
* by the CICS Client will be in. The value is only applicable during
* installation. Valid values are:-
*
*           MESSAGELANG = US      - US English
*                               AA  - Arabic
*                               CN  - Simplified Chinese
*                               TW  - Traditional Chinese
*                               CZ  - Czechoslovakian
*                               DK  - Danish
*                               FI  - Finnish
*                               FR  - French
*                               FR  - Canadian French
*                               DE  - German
*                               HU  - Hungarian
*                               IT  - Italian
*                               JP  - Japanese
*                               KR  - Korean
*                               NO  - Norwegian
*                               PL  - Polish
*                               BR  - Brazilian Portuguese
*                               PT  - Portuguese
*                               RU  - Russian
*                               ES  - Spanish
*                               SE  - Swedish
*                               TR  - Turkish
*
*
* MESSAGELANG = US
*
*
```

Figure 38 (Part 3 of 3). Sample CICS clients response file - CICS Client for OS/2

## Performing installation and maintenance

### Return codes

All return codes are two-byte hexadecimal values as follows:

- |              |   |
|--------------|---|
| <b>00 00</b> | Successful termination. No messages were logged.  |
| <b>00 04</b> | Successful termination. Warning messages were logged. Restarting the workstation operating system is not required.  |
| <b>00 08</b> | Successful termination. Error messages were logged. Restarting the workstation operating system is not required.  |
| <b>00 12</b> | Successful termination. Severe error messages were logged. Restarting the workstation operating system is not required.   |
| <b>FE 00</b> | Successful termination. Restarting the workstation operating system is required. Do not invoke the installation and maintenance program again.  |
| <b>FE 04</b> | Successful termination. Warning messages were logged. Restarting the workstation operating system is required. Do not invoke the installation and maintenance program again.          |
| <b>FE 12</b> | Successful termination. Severe error messages were logged. Restarting the workstation operating system is required. Do not invoke the installation and maintenance program again.     |
| <b>FE yy</b> | Successful termination. yy can vary within the range 00 to FF. Restarting the workstation operating system is required. Do not invoke the installation and maintenance program again. |

Messages are logged only when the /X parameter is used.

## Using SystemView for OS/2 to install CICS clients

---

### Using SystemView for OS/2 to install CICS clients

You can use SystemView for OS/2 to install CICS Client for OS/2 on unattended workstations using the statements included in a file called a *software profile* and a response file. A software profile is used by SystemView for OS/2 to invoke an application installation program. A response file is used by the installation program to get all of the data it needs during the installation process.

Using SystemView for OS/2, you specify the information for the software profiles and response files when you customize the application definition file (.ADF), which defines how to install and configure CICS clients. This file is shipped with CICS Client for OS/2 as CICSCLI.ADF.

For a complete description of software profiles and response files, refer to the SystemView for OS/2 online help or the *SystemView for OS/2 Up and Running!*, SH19-4184.

### Overview of SystemView for OS/2 installation

To install CICS clients on workstations using SystemView for OS/2, you need to:

1. Copy CICS clients files to the code server, that is, the workstation from which you will install CICS clients
2. Add CICS clients information to the SystemView for OS/2 software library
3. Configure CICS clients in the SystemView for OS/2 software library
4. Distribute and install the resulting software object on target server workstations using SystemView for OS/2.

The first step is described in this book. For information on the other steps, refer to the SystemView for OS/2 online help or to the SystemView for OS/2 documentation.

### Copying CICS clients to the code server

To set up the code server so that you can install CICS clients using SystemView for OS/2, use the XCOPY command.

For example, to copy the files for CICS Client for OS/2 from the CD-ROM in the E: drive to the D: drive, you would enter this command:

```
XCOPY E:\CLIENTS\I86_CLNT\CLIENTS\OS2\ D:\CID\IMG\CLIENTS\OS2 /S
```

This command would copy the files from the \CLIENTS\OS2 subdirectory on the CD-ROM in the E: drive to the D:drive, putting the files under the directory \CID\IMG\CLIENTS\OS2.

The /S indicates that all of the subdirectories and their contents, and the contents of the root directory should be copied.

## Using SystemView for OS/2 to install CICS clients

---

### Chapter 10. Migrating from CICS for OS/2 Distributed Feature clients

**This chapter discusses**

- “Upgrading Distributed Feature clients”
- “Application compatibility” on page 254.

This chapter describes how to migrate from using the Distributed Feature clients of CICS for OS/2 to using IBM CICS Clients. Distributed Feature clients were first shipped with CICS for OS/2 Version 2.0 and are supported for CICS for OS/2 Version 2.0.1. (Although the use of IBM CICS Clients is recommended.)

---

#### Upgrading Distributed Feature clients

Existing CICS for OS/2 initialization files used by CICS for OS/2 Distributed Feature clients are supported by the IBM CICS clients. Keywords Sysid, TRClientTerm and TRTraceControl are ignored, because these functions are not supported by IBM CICS Clients. Any attempt to mix the old and new format files results in an error.

The following shows the mapping between the parameter names in the Distributed Feature client initialization file (FAARQ.INI) and the IBM CICS Clients file (default CICSCLI.INI):

<b>FAARQ.INI</b>	<b>CICSCLI.INI</b>
NetBiosBufSize	MaxBufferSize
ServerName	NetName
Sysid	No equivalent
LocalNetName	Client
AdapterNumber	Adapter
LogicalSessionLimit	MaxRequests
TRModelName	ModelTerm
TRInitialTransid	InitialTransid
TRExitTerm	TerminalExit
TRClientTerm	No equivalent
TRTraceControl	No equivalent
TraceFileName	TraceFile

## Application compatibility

---

### Application compatibility

Applications that run on the CICS for OS/2 Distributed Feature clients should run successfully on CICS clients.

**Note:** For CICS Client for Macintosh, only applications written in the C language are supported. The PL/I language is supported for CICS Client for OS/2 only.

### ECI and EPI compatibility

DOS, Windows, and OS/2 ECI and EPI applications written for Distributed Feature clients of CICS for OS/2 are portable at the binary level to the corresponding members of the IBM CICS Clients family (With CICS Client for Windows 95 and CICS Client for Windows 95 Version 2.0.3 and later it is also possible to port 16-bit applications to 32-bit applications). If such applications are to be changed, or if they need to be ported to other client platforms, the ECI call requires very minor changes before recompiling.

#### Notes:

1. The header files are now called `cics_eci.h` (C), `cicseci.cbl` (COBOL), `cics_eci.inc` (PL/I); and `cics_epi.h` (C), `cicsepi.cbl` (COBOL), `cics_epi.inc` (PL/I). References to `faaecih.h` and `faaejih.h`, or `faaeciw.cbl` and `faaejiw.cbl` must be changed.
2. The CICS ECI entry point is now called `CICS_ExternalCall()` for C and PL/I, and `_CICS_ExternalCall` (16-bit) or `CICSEXTERNALCALL` (32-bit) for COBOL.
3. The CICS EPI entry point is now called `CICSEXTERNALCALL` for 32-bit COBOL. Any calls to `FaaExternalCall()` must be changed.
4. The correct link libraries are now called `CCLDOS.LIB` (for DOS), `CCLWIN.LIB` (for Windows Family) and `CCLOS2.LIB` or `CCLOS232.LIB` (for 16-bit and 32-bit OS/2 respectively). Attempts to link with `FAACLIB.LIB` or `FAACIC32.LIB` will fail.
5. Full 32-bit applications are supported for both ECI and EPI by linking with the `CCLOS232.LIB`. However, some of the client itself is still built as a 16-bit application so you must take care not to pass it data structures that span a 64KB boundary. The IBM C Set++ compiler provides options and facilities to prevent this.

ECI and EPI client applications are portable between members of the CICS clients family, provided the application does not contain operating-system-specific calls.

For more information, refer to the *CICS Family: Client/Server Programming* book.



---

## Appendix A. The IBM CICS Clients library

This chapter lists all the IBM CICS Clients and related books and discusses the various forms in which they are available:

The headings in this chapter are:

- "IBM CICS Clients books"
- "Other CICS publications" on page 256
- "Viewing online information" on page 257
- "Printing and ordering books" on page 260.

---

### IBM CICS Clients books

The IBM CICS Clients library comprises the following books:

- *IBM CICS Clients Administration*, SC33-1792

This book describes the administration of the IBM CICS Clients:

- CICS Client for DOS
- CICS Client for OS/2
- CICS Client for Windows
- CICS Client for Windows 95
- CICS Client for Windows NT
- CICS Client for Macintosh

- *IBM CICS Clients Gateways*, SC33-1821

This book describes how to use CICS gateway for Lotus Notes and CICS Internet gateway.

- *IBM CICS Clients Messages*, GC33-1793

This online book lists the error messages that can be generated by IBM CICS Clients and CICS gateway for Lotus Notes.

You cannot order this book.

## Other CICS publications

---

### Other CICS publications

Related books from other CICS libraries that are included on the CD-ROM include:

- *CICS Family: Client/Server Programming*, SC33-1435

This book provides guidance and reference information about CICS Family Client/Server Programming; the External Call Interface (ECI) and the External Presentation Interface (EPI). It is intended for application designers and programmers who wish to develop client applications to use CICS systems as servers.

- *CICS Family: OO Programming in C++ for CICS Clients*, SC33-1923

This book describes how to write object oriented programs for the ECI and EPI in the C++ language.

- *CICS Family: OO Programming in BASIC for CICS Clients*, SC33-1924

This book describes how to write object oriented programs for the ECI and EPI in the BASIC language.

## Viewing online information

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### Viewing online information

IBM CICS Clients has the following types of online information:

- IPF (information presentation facility) books, supplied for CICS Client for OS/2, CICS Client for Windows, CICS Client for Windows NT, and CICS Client for Windows 95
- HTML (HyperText Markup Language) books
- PDF (Portable Document Format) books.

### Viewing IPF books

The IPF viewer contains powerful search facilities, and because all the books supplied are built with hypertext links to each other, you can easily follow the cross references from one book to another.

You choose whether to install the IPF books during installation, as described in Chapter 3, "Installing CICS clients" on page 35. If you choose to install them, the books are readily available on your desktop.

The CICS Client for OS/2 books are in the **IBM CICS Client for OS/2** folder, and the CICS Client for Windows Family books are in the respective group or folder.

If you installed a language other than US English, you may have IPF books in that language too. Although only some of the books are likely to have been translated, you will still have a full set of books in the folder. This allows you to follow hypertext links between the translated books and the US English books. You cannot tell which books have been translated until you open them.

To view an IPF book, open the folder or group and double-click on the icon for the book you want to read; each IPF book has a separate icon.

Once inside a book, you will be able to follow hypertext links to the other books in the library by double-clicking in the highlighted fields. To return from a book you have linked to, just close that book, and you will return to the first book.

To search for specific information, click on the **Search** push button and enter your search criteria. A panel will be presented with all search matches. Click on the one you wish to view.

**Note:** In Windows NT Version 4.0 and in Windows 95, it is not possible to view IPF books by selecting the relevant icon in Windows Explorer. This is because IPF books have a file type of .INF, normally associated with Setup files in these operating systems.

## Viewing online information

### Viewing HTML books

HTML books are available for viewing with a Web browser. You can find HTML books at the following Web site:

<http://www.software.ibm.com/ts/cics/library/manuals/>

The HTML books are generally available in US English and possibly in other languages.

### Viewing HTML from CD-ROM

For releases of CICS clients delivered on CD-ROM, you can browse the books directly from the CD-ROM, from the CD-ROM accessed over the LAN, or from a drive to which the CD-ROM has been copied with the same directory structure. Your system administrator can tell you the name of any network drive that you must connect to.

To read the HTML publications, start your browser and open the html file you require. Alternatively, for the CICS Client for Windows Family, you can open File Manager or Windows Explorer and then select the file you want to use. Your browser is then started automatically.

The file called INDEX.HTM provides a list of languages into which CICS Clients are translated. When you select a language from this file, you are taken to the list of CICS Clients and CICS Family books for your language. This list is in the CCL*r**n*800 file for each language, where *r* is a release identifier and *n* is a language identifier (see Table 28 on page 261). An example of a book list for French is CCLDF800.htm and this would be in the \HTML\FR directory.

You may find that not all of the books in the list have been translated. If you select a book that has not been translated, you are taken to the English version.

If you prefer, you can go directly to the list of books for your language. Also, you can save this file as a bookmark on your browser. You must remember, however, that if you access the file over the LAN, the file specification may change due to changes in LAN drive assignments.

You are provided with the HTML source files, which means that you can edit the HTML publications for your own purposes. If you do so, remember that you may alter the hypertext linking structure of the books. Your edited books would then have a different structure to any updated HTML publications provided by IBM.

### Viewing PDF books

PDF books are provided for viewing with Adobe Acrobat Reader. The PDF books are available on the same Web site from which you download the CICS clients:

<http://service2.software.ibm.com/dl/ccclient203/cc1i203-w>

To read the PDF publications, start the Acrobat Reader and open the PDF file you require. You can then view the book, easily navigate through it, search for specific information, and also print all or part of the book.

## Viewing online information

You can download Acrobat Reader from the world wide web at:

<http://www.adobe.com/acrobat/>

### Viewing PDF from CD-ROM

For releases of CICS clients delivered on CD-ROM, the PDF books are provided in the \PSBOOKS directory on the CD-ROM. The PDF books have the same layout as PostScript books, from which they are generated.

You can browse the books directly from the CD-ROM, from the CD-ROM accessed over the LAN, or from a drive to which the CD-ROM has been copied with the same directory structure. Your system administrator can tell you the name of any network drive that you must connect to.

## Printing and ordering books

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### Printing and ordering books

You can print the CICS clients books on a PostScript printer or you can purchase printed copies from IBM.

You can print the PDF versions of the books and, for releases of the CICS clients supplied on CD-ROM, the PostScript versions.

### Understanding the book file names

The file naming conventions for the books are as follows.

File names are PPPVLBnn, where:

**PPP** Library prefix:

CCL CICS Clients

DFH CICS Family

**V** The version of the product components:

C CICS Clients Version 2.0.1

D CICS Clients Version 2.0.2

E CICS Clients Version 2.0.3

F CICS Clients Version 2.0.4

Z CICS Family books

**L** A one-character language code, for example 'A' for US English, see "Using language codes in file names" on page 261

**B** A one-character book identifier, in the range A-Z, 0-9

**nn** File maintenance level

For example, the US English version of the IBM CICS Clients Version 2.0.4 *Administration* book is CCLFAA00. The same book in French would be CCLFFA00.

Book title	File name	Pages
CICS Clients Administration	CCLFAA	310
CICS Clients Messages	CCLFAB	80
CICS Clients Gateways	CCLEAC	40
CICS Family: Client/Server Programming	DFHZAD	180
CICS Family: OO Programming in C++ for CICS Clients	DFHZAI	100
CICS Family: OO Programming in BASIC for CICS Clients	DFHZAJ	100

**Note:** The File names in this table do not include the 2-digit suffix.

**Note:** The CICS Clients Gateways book has not been updated for Version 2.0.4 of CICS Clients.

## Printing and ordering books

### Using language codes in file names

The language codes used in the file names of translated books are as follows:

<b>Language</b>	<b>Code</b>	<b>Language</b>	<b>Code</b>
Arabic	9	Italian	I
Brazilian Portuguese	B	Japanese	J
Chinese Simplified	Z	Korean	K
Chinese Traditional	T	Norwegian	N
Czech	1	Polish	Y
Danish	D	Russian	5
Portuguese	P	Spanish	S
Finnish	O	Swedish	V
French	F	Turkish	X
German	G	US English	A
Hungarian	0		

## Printing and ordering books

### Printing PostScript manuals

You can print a PostScript book from the Drives folder (OS/2), using drag and drop, if you have a printer icon on your desktop:

1. Identify the file name of the book for your language
2. Double click on the **Drives** icon
3. Double click on your **CD-ROM** drive icon
4. Double click on the **PSBOOKS** directory
5. Drag the file you want to print to your PostScript printer icon

Alternatively, to print a PostScript book from the OS/2 or DOS command prompt:

1. Identify the file name of the book, in your language
2. Go to a command prompt
3. Switch to the drive letter of the CD-ROM
4. Type `cd psbooks` and press Enter
5. Use the `copy` command to copy the file to your PostScript printer

**Note:** You will need to include the file name suffix (nn) which is not shown in Table 27 on page 260. All the CCL prefix books are 00, you can check the other books by issuing the `dir` command against the PSBOOKS directory.

### Ordering books

You can use the order numbers shown in "IBM CICS Clients books" on page 255 to order publications through your IBM representative or the IBM branch office serving your locality.

To order publications in the United States dial 1-800-879-2755, or in Canada dial 1-800-IBM-4YOU.



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## Glossary

This glossary defines special terms used in this book.

If you cannot find the word you are looking for, try the *IBM Dictionary of Computing*.

### A

**APING.** A command used to verify an APPC link.

**APPC.** Advanced program-to-program communication. An implementation of the SNA/SDLC LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs. The APPC protocol is used by IBM CICS Clients to communicate with CICS server systems.

**AppleTalk.** A local area network standard developed by Apple Computer Inc. The AppleTalk protocol operates on Ethernet, Token Ring, and LocalTalk LANs and allows Macintosh users to share printers, files, and application resources. See *LocalTalk*.

**application definition file.** In software preparation, a file that contains information about how to install a particular CID-enabled software product, and how to gather configuration parameters to be used in the response file and software object.

**application server.** A CICS run-time process that executes CICS tasks.

**ATI.** See *automatic transaction initiation*.

**Attach.** In SNA, the request unit that flows on a session to initiate a conversation.

**Attach Manager.** The component of APPC that matches Attaches received from remote computers to accepts issued by local programs.

**autoinstall.** A facility that enables terminal definitions to be created automatically in a CICS server on request. The definition is deleted when the client terminal is logged off.

**automatic transaction initiation (ATI).** The process whereby a transaction request made internally within a CICS system or network leads to the scheduling of the transaction. An ATI request from a CICS client can cause the initiation of a transaction in a CICS server system.

### B

**BIND.** In SNA, a request to activate a session between two logical units (LUs).

**business logic.** The part of a distributed application that is concerned with the application logic rather than the user interface of the application. See *presentation logic*.

### C

**CICS Gateway for Java.** CICS Client for OS/2 and CICS Client for Windows NT incorporate CICS Gateway for Java, which provides an interface between a Java program and CICS, and so allows a Java-enabled browser to dynamically download a Java Applet and transparently access CICS data.

**CICS gateway for Lotus Notes.** CICS Client for OS/2 and CICS Client for Windows NT incorporate CICS gateway for Lotus Notes, which provides a mechanism by which a Lotus Notes application may access resources on any CICS server.

CICS gateway for Lotus Notes is also known as CICS link for Lotus Notes.

**CICS Internet gateway.** CICS Client for OS/2 and CICS Client for Windows NT incorporate CICS Internet gateway, which enables a Web browser to be used as an emulator via the Internet for a 3270 CICS application running on a CICS server.

**CICS on Open Systems.** A term used to refer generically to the products: CICS for AIX (previously called CICS/6000), CICS for HP-UX, CICS for Digital UNIX, CICS for Siemens-Nixdorf SINIX, and CICS for Sun Solaris.

**CICS on System/390.** A term used to refer generically to the products: CICS for MVS/ESA, CICS/MVS, and CICS/VSE.

**cicsprnt.** A command that allows you to define a printer terminal on the CICS client workstation. The command enables CICS applications running on the server to direct output to the client-attached printer.

## Glossary

**cicsteld.** A command that starts a CICS telnet daemon. The telnet daemon allows a telnet 3270 client to connect to a CICS server.

This is supported with CICS Client for OS/2, CICS Client for Windows 95, and CICS Client for Windows NT only.

**cicsterm.** A command that provides 3270 emulation and enables connection to a CICS region.

**cicsterp.** In CICS Client for DOS only, a command that provides 3270 terminal and printer emulation, and enables connection to a CICS region.

**CID.** Configuration, installation, and distribution.

**CID methodology.** An IBM-specified way to install and configure products on, or remove products from, remote workstations and hosts. CID-enabled products use response files and redirected installation and configuration to eliminate or reduce user interaction with the CID-enabled product.

**Change-Number-of-Sessions (CNOS).** An internal transaction program that regulates the number of parallel sessions between the partner LUs with specific characteristics.

**client/server.** A distributed application design model, in which the client sends a request to its partner, the server, which executes the request and returns the results to the client. This design model is associated typically with cooperative processing.

**client initialization file.** A file containing configuration information used to inform the CICS client of the CICS servers it can connect to, and the communication protocols to be used.

**CNOS.** See *Change-Number-of-Sessions*.

**color mapping file.** A file used by IBM CICS Clients to customize the 3270 screen color attributes on client workstations.

**COMMAREA.** A communication area that is used for passing data both between programs within a transaction and between transactions.

**Common Programming Interface for Communication (CPI-C).** CPI-C is the Systems Application Architecture (SAA) API for communications. It provides a standard set of function calls for all APPC platforms that support CPI-C. These calls correspond to APPC verbs, which are platform-dependent.

**connection.** (1) In data communication, an association established between functional units for conveying information. (2) In Open Systems Interconnection architecture, an association established by a given layer between two or more entities of the next higher layer for the purpose of data transfer. (3) In TCP/IP, the path between two protocol application that provides reliable data stream delivery service. In Internet, a connection extends from a TCP application on one system to a TCP application on another system.

**control table.** In CICS, a storage area used to describe or define the configuration or operation of the system.

**conversation.** (1) The communication between a CICS client and a CICS server. (2) In APPC, a connection between two transaction programs over an LU-LU session that allows them to communicate with each other while processing a transaction. See also *session*.

**conversation security.** In APPC, a process that allows validation of a user ID or group ID and password before establishing a connection.

**cooperative processing.** A subset of *distributed processing*, in which at least the user interface (presentation) aspect of the application runs on a programmable workstation.

## D

**data link control (DLC).** A set of rules used by nodes on a data link (such as an SDLC link or a token ring) to accomplish an orderly exchange of information.

**DBCS.** See *double-byte character set*.

**DCE.** See *distributed computing environment*.

**dependent LU.** A logical unit (LU) that can receive, but not send a BIND, and which supports only single sessions. See *BIND*.

**distributed application.** An application for which the component application programs are distributed between two or more interconnected processors.

**distributed computing environment (DCE).** The Distributed Computing Environment (DCE) provides secure, authenticated, client/server interoperability across diverse platforms.

## Glossary

**Distributed Feature client.** The CICS clients supplied with CICS for OS/2 Version 2.0. These are functionally inferior to IBM CICS Clients.

**distributed processing.** The processing of different parts of the same application in different systems, on one or more processors.

**domain.** In the Internet, a part of a naming hierarchy in which the domain name consists of a sequence of names (labels) separated by periods (dots).

**domain name.** In TCP/IP, a name of a host system in a network.

**Domain Name Server.** In TCP/IP, a server program that supplies name-to-address translation by mapping domain names to internet addresses. Synonymous with name server.

**dotted decimal notation.** The syntactical representation for a 32-bit integer that consists of four 8-bit numbers written in base 10 with periods (dots) separating them. It is used to represent IP addresses.

**double-byte character set (DBCS).** A set of characters in which each character is represented by 2 bytes. Languages such as Japanese, Chinese and Korean, which contain more symbols than can be represented by 256 code points, require double-byte character sets. Because each character requires 2 bytes, the typing, display, and printing of DBCS characters requires hardware and programs that support DBCS. Contrast with *single-byte character set*.

## E

**ECl.** See *external call interface*.

**emulator, emulation program.** A program that allows a host system to communicate with a workstation in the same way as it would with the emulated terminal. In IBM CICS Clients the terminal emulation function allows client workstations to run CICS transactions that use 3270 data flows.

**EPI.** See *external presentation interface*.

**Ethernet.** A 10-megabit baseband local area network that allows multiple stations to access the transmission medium at will without prior coordination, avoids contention by using carrier sense and deference, and resolves contention by using collision detection and

transmission. Ethernet uses carrier sense multiple access with collision detection (CSMA/CD).

**external call interface (ECI).** A facility that allows a non-CICS program to run a CICS program. Data is exchanged in a COMMAREA as for normal CICS interprogram communication.

**external presentation interface (EPI).** A facility that allows a non-CICS program to appear to CICS as one or more standard 3270 terminals. 3270 data can be presented to the user by emulating a 3270 terminal or by using a graphical user interface.

## G

**gateway.** A device that connects two dissimilar LANs, or that connects a LAN to a wide area network (WAN), midrange computer, or mainframe computer. A gateway device has its own processor and memory and may perform protocol conversion. A gateway handles multiple communication sessions simultaneously.

## H

**host.** In the Internet suite of protocols, an end system. The end system can be any system; it does not have to be a mainframe.

**host address.** An IP address that is used to identify a host in an internet.

**host ID.** In TCP/IP, that part of the Internet address that defines the host on the network. The length of the host ID depends on the type of network or network class (A, B, or C).

**host name.** In the Internet suite of protocols, the domain name of a host.

## I

**independent LU.** A logical unit (LU) that can both send and receive a BIND, and which supports single, parallel, and multiple sessions. See *BIND*.

**internet.** A collection of networks interconnected by a set of routers that allow them to function as a single, large network. Contrast with *Internet*.

**Internet.** The internet administered by the Internet Architecture Board (IAB), consisting of large national

## Glossary

backbone networks and many regional and campus networks all over the world. The Internet uses the Internet suite of protocols.

**Internet address.** See *IP address*.

**Internet Architecture Board.** The technical body that oversees the development of the internet suite of protocols known as TCP/IP.

**Internet Packet Exchange (IPX).** In Novell NetWare LANs, a communication protocol that sends data packets to requested destinations.

**Internet Protocol (IP).** In TCP/IP, a protocol that routes data from its source to its destination in an Internet environment.

**Interoperability.** The capability to communicate, execute programs, or transfer data among various functional units in a way that requires the user to have little or no knowledge of the unique characteristics of those units.

**IP.** Internet Protocol.

**IP address.** The 32-bit address defined by the internet protocol, standard 5, Request for Comment (RFC) 791. It is usually represented in dotted decimal notation.

**IPX.** Internet Packet Exchange.

## K

**keyboard mapping file.** A file used by IBM CICS Clients to customize the keyboard mapping of client workstations.

## L

**LAN.** See *local area network*.

**link support layer (LSL).** The part of Novell's Open Data-Link Interface (ODI) that allows the LAN driver for a network adapter to service more than one protocol. See *Open Data-Link Interface (ODI)*.

**local area network (LAN).** A network of workstations, or terminals, or both, where all the connected systems are relatively near to each other. See *wide area network*.

**LocalTalk.** The connectors and cables manufactured by Apple Computer Inc. for use in AppleTalk networks.

**logical unit (LU).** In SNA, a port through which an end user accesses the SNA network in order to communicate with another end user and through which the end user accesses the functions provided by system services control points (SSCP). An LU can support at least two sessions, one with an SSCP and one with another LU, and may be capable of supporting many sessions with other logical units. See *network addressable unit*, *primary logical unit*, *secondary logical unit*.

**LU-LU session.** In SNA, a session between two logical units (LUs) in an SNA network. It provides communication between two end users, or between an end user and an LU services component.

**LU-LU session type 6.2.** In SNA, a type of session for communication between peer systems. Synonymous with APPC protocol.

**LU 6.2.** See *APPC*.

## M

**MAC.** Medium access control.

**medium access control (MAC) sublayer.** One of two sublayers of the ISO Open Systems Interconnection data link layer proposed for local area networks by the IEEE Project 802 Committee on Local Area Networks and the European Computer Manufacturers Association (ECMA). It provides functions that depend on the topology of the network and uses services of the physical layer to provide services to the logical link control (LLC) sublayer. The OSI data link layer corresponds to the SNA data link control layer.

**mode.** In SNA, a set of parameters that defines the characteristics of a session between two LUs.

## N

**name server.** (1) In TCP/IP, synonym for Domain Name Server (2) In Internet communications, the host that translates host names into their respective internet addresses when requested by the hosts on the network (3) A physical device, and its associated software, that enables a processor or controller to be connected to a network.

**NDIS.** Network Driver Interface Specification.

## Glossary

**NetBIOS.** Network Basic Input/Output System. The standard interface to networks, IBM personal computers (PCs), and compatible PCs, that is used on LANs to provide message, print server, and file-server functions. The IBM NetBIOS application program interface (API) provides a programming interface to the LAN so that an application program can have LAN communication without knowledge and responsibility of the data link control (DLC) interface.

**network address.** In SNA, an address, consisting of subarea and element fields, that identifies a link, link station, or network addressable unit (NAU). Subarea nodes use network addresses; peripheral nodes use local addresses. The boundary function in the subarea node to which a peripheral node is attached transforms local addresses to network addresses and vice versa. See also *network name*.

**network addressable unit (NAU).** In SNA, a logical unit, a physical unit, or a system services control point. The NAU is the origin or the destination of information transmitted by the path control network. See also *logical unit*, *network address*, *network name*.

**network name.** In SNA, the symbolic identifier by which end users refer to a network addressable unit (NAU), link station, or link. See also *network address*.

**Network Driver Interface Specification (NDIS).** A specification developed jointly by Microsoft and 3Com that lets a DOS or OS/2 system support one or more network adapters and protocol drivers. The device driver functions at the medium access control (MAC) layer. This kind of driver is also called an NDIS MAC driver.

**node type.** In SNA, a designation of a node according to the protocols it supports and the network addressable units (NAUs) it can contain. Four types are defined: 1, 2, 4, and 5. Type 1 and type 2 nodes are peripheral nodes; type 4 and type 5 nodes are subarea nodes.

## O

**ODI.** Open Data-Link Interface.

**Open Data-Link Interface (ODI).** Novell's architecture that allows multiple LAN drivers and protocols to coexist in network systems. The ODI specification defines the set of interface and software modules used to decouple device drivers from protocol stacks and to enable

multiple protocol stacks to share transparently the network hardware.

## P

**pacings.** A technique by which a receiving station controls the rate of transmission of a sending station to prevent overrun.

**packet internet groper (PING).** In Internet communications, a program used in TCP/IP networks to test the ability to reach destinations by sending the destinations an Internet Control Message Protocol (ICMP) echo request and waiting for a reply.

**parallel session.** In SNA, two or more concurrently active sessions between the same two LUs using different pairs of network addresses. Each session can have independent session parameters.

**PING.** (1) Packet internet groper. (2) The command that sends an ICMP Echo Request packet to a gateway, router, or host with the expectation of receiving a reply.

**partner logical unit (PLU).** In SNA, the remote participant in a session.

**partner transaction program.** The transaction program engaged in an APPC conversation with a local transaction program.

**PLU.** (1) Primary logical unit. (2) Partner logical unit.

**port.** (1) An endpoint for communication between devices, generally referring to a logical connection. (2) A 16-bit number identifying a particular Transmission Control Protocol (TCP) or User Datagram Protocol (UDP) resource within a given TCP/IP node.

**presentation logic.** The part of a distributed application that is concerned with the user interface of the application. See *business logic*.

**primary logical unit (PLU).** In SNA, the logical unit (LU) that contains the primary half-session for a particular LU-LU session. Contrast with secondary logical unit. See also *logical unit*.

**Note:** A particular logical unit may contain primary and secondary half-sessions for different active LU-LU sessions.

**protocol boundary.** The signals and rules governing interactions between two components within a node.

## Glossary

### Q

**QLLC.** qualified logical link control (QLLC).

**qualified logical link control (QLLC).** An X.25 protocol that allows the transfer of data link control information between two adjoining SNA nodes that are connected through an X.25 packet-switching data network.

### R

**remote procedure call (RPC).** Remote procedure calls (are analogous to the standard procedure calls used in modern programming, providing modularity and reducing code size. The main difference between standard procedure calls and remote procedure calls is that in a remote procedure call, the called procedure is being executed by a different process than the caller. To the calling procedure, a remote procedure call looks the same as a call to a local procedure. When a program makes a remote procedure call to a remote application, the procedure's parameters are automatically bundled into a request message, which is then sent to the remote program or system.

**request unit (RU).** In SNA, a message unit that contains control information such as a request code, or function management (FM) headers, end-user data, or both.

**request/response unit.** A generic term for a request unit or a response unit. See also *request unit* and *response unit*.

**response file.** A file that contains a set of predefined answers to questions asked by a program and that is used in place of a user dialog. See *CID methodology*.

**response unit (RU).** A message unit that acknowledges a request unit; it may contain prefix information received in a request unit.

**RU.** (1) Request unit. (2) Response unit.

**RPC.** See *remote procedure call*.

### S

**SAA.** See *Systems Application Architecture*.

**SBCS.** See *single-byte character set*.

**SDLC.** See *Synchronous Data Link Control*.

**secondary logical unit (SLU).** In SNA, the logical unit (LU) that contains the secondary half-session for a particular LU-LU session. Contrast with primary logical unit. See also *logical unit*.

**session.** In SNA, a logical connection between two network addressable units (NAUs) that can be activated, tailored to provide various protocols, and deactivated as requested. The session activation request and response can determine options for such things as rate and concurrency of data exchange, control of contention and error recovery, and characteristics of the data stream. Sessions compete for network resources, such as links within the path control network. For routing purposes, each session is identified by the network or local addresses of the session partners. See *LU-LU session*, *LU-LU session type*.

**session limit.** In SNA, the maximum number of concurrently active LU-LU sessions that a particular logical unit (LU) can support.

**side information.** System-defined values required by CPI-C to initialize a conversation. These values include the partner LU name, mode name, and transaction program name. See *Common Programming Interface for Communication (CPI-C)*.

**single-byte character set (SBCS).** A character set in which each character is represented by 1 byte. Contrast with double-byte character set.

**SNA gateway.** A gateway that handles multiple APPC communication sessions simultaneously. See *gateway*.

**SNA•ps.** A software product from Apple Computer Inc. that provides SNA interoperability and network support for Macintosh users and AppleTalk networks. SNA•ps provides SNA network protocols for 3270 terminal emulation, file transfer, and printer support, and an APPC programming interface.

**SNA sense data.** An SNA-defined encoding of error information. In SNA, the data sent with a negative response, indicating the reason for the response.

## Glossary

**SNASVCMG mode name.** The SNA service manager mode name. This is the architecturally-defined mode name identifying sessions on which CNOS is exchanged. Most APPC-providing products predefine SNASVCMG sessions.

**subnet.** (1) In TCP/IP, a part of a network that is identified by a portion of the Internet address. (2) Synonym for subnetwork.

**subnet address.** In Internet communications, an extension to the basic IP addressing scheme where a portion of the host address is interpreted as the local network address.

**Synchronous Data Link Control (SDLC).** A communications protocol for managing synchronous, code-transparent serial-by-bit information transfer over a link connection.

**Systems Application Architecture (SAA).** A set of IBM software interfaces, conventions, and protocols that provide a framework for designing and developing applications across multiple computing environments.

**Systems Network Architecture (SNA).** The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through, and controlling the configuration and operation of, networks.

**SystemView for OS/2.** A set of system management applications that:

- Provides the administrator with functions to monitor and manage OS/2 managed systems on a LAN, keep track of hardware and software resources; and make software available to managed systems, and
- Provides the end user at the managed system with the functions to perform a variety of systems management tasks on the local system in cooperation with the SystemView manager.

## T

**TCP62.** A protocol mapper provided by VTAM that allows partner LU62 applications to communicate over a TCP/IP network.

**TCP/IP.** Transmission Control Protocol/Internet Protocol.

**terminal emulation.** The capability of a microcomputer or personal computer to operate as if it were a particular

type of terminal linked to a processing unit and to access data.

**token ring.** A network with a ring topology that passes tokens from one attaching device to another; for example, the IBM Token-Ring network.

**trace.** (1) A record of data that provides a history of events that occurred in a system. (2) The process of recording the sequence in which the statements in a program are executed and, optionally, are the values of the program variables used in the statements.

**transaction program.** A program that uses the APPC application program interface (API) to communicate with a partner application program in the same node or at a partner node.

**Transmission Control Protocol/Internet Protocol (TCP/IP).** A set of communications protocols that support peer-to-peer connectivity functions for both local and wide area networks. TCP/IP can be used for client-server links between IBM CICS Clients and, for example, CICS for OS/2, CICS for Windows NT.

**type 2.0 node.** An SNA node that attaches to a subarea network as a peripheral node and provides full end-user services but no intermediate routing services.

**type 2.1 node.** An SNA node that can be configured as an endpoint or intermediate routing node in a network, or as a peripheral node attached to a subarea network.

## U

**user session.** Any APPC session other than a SNASVCMG session.

## V

**VDD.** Virtual device driver.

**verb.** (1) A reserved word that expresses an action to be taken by an application programming interface (API), a compiler, or an object program. (2) In SNA, the general name for a transaction program's request for communication services.

**virtual device driver (VDD).** A type of device driver used by DOS programs running in a DOS virtual machine, in order to access devices such as the screen or mouse, which must be shared with other processes in the system. The virtual device driver maps DOS device

## Glossary

commands to the normal (physical) device driver under OS/2.

### W

**wide area network (WAN).** A network that provides communication services to a geographic area larger than that served by a local area network or a metropolitan area network, and that may use or provide public communication facilities.

### Z

**Zone.** In AppleTalk networks, a subset of nodes within an internet.



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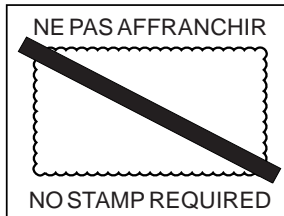
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