PC Network Bridge Program

User's Guide

Communications Family

Second Edition (June 1990)

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About This Book

The IBM PC Network Bridge Program (*Bridge Program*) enables communication between devices that are connected to different LAN segments. A LAN segment is either a ring of an IBM Token-Ring Network or a bus of a broadband or baseband IBM* PC Network*. The Bridge Program connects broadband and baseband PC Network segments and Token-Ring Network segments operating at either 4 or 16 Mbps. Broadband PC Network segments can use the same or different frequency pairs.

This Bridge Program also supports communication with up to four IBM LAN Manager programs. You can use the IBM LAN Manager through a link with the bridge to change some bridge configuration parameters. The IBM LAN Manager can receive bridge error messages, alerts, and LAN segment status. See "Using the Bridge Program with the IBM LAN Manager" on page 2-2 and the *IBM LAN Manager User's Guide* for more information about bridge management.

Users of This Manual

The users of this manual are the installer of the Bridge Program, the operator of the Bridge Program, and the network planner or administrator.

This manual explains:

- To the Bridge Program installer, how to
  - Prepare the computer
  - Prepare, set, and install the adapters
  - Prepare and install programs and files using the Installation Program
- To the Bridge Program operator, how to
  - Use the Configuration Program
  - Start and stop Bridge Program operation
  - Load the Bridge Program
  - Use the Bridge Program functions
  - Perform problem determination

- To the network planner or administrator
  - Default values, and valid values for the Bridge Program configuration parameters
  - Instructions for completing the Bridge Planning Chart
  - Planning for Bridge Program installation
  - Evaluating bridge traffic flow
  - Performing problem determination.

"What You Need" on page 1-6 lists the computer equipment and supplies you will need to install and operate the Bridge Program in your network.

Prerequisite Knowledge

If you are the **bridge operator**, knowledge of the supported IBM Personal System/2* (PS/2*) computers with Micro Channel* architecture and DOS Version 3.3 or later is required. You will also find it helpful to be familiar with the IBM PC Network, both broadband and baseband, IBM Token-Ring Network, and LAN concepts.

If you are the **network administrator**, the following knowledge is required: knowledge of the supported IBM PS/2 computers, DOS Version 3.3 or later, IBM PC Network, both broadband and baseband, IBM Token-Ring Network (if used in your network), and LAN concepts.

Organization

Chapter 1 is an introduction to the Bridge Program: how you use the bridge in a network, the contents of the Bridge Program package, and the computer hardware, software, and supplies you need to install and operate the Bridge Program.

Chapter 2 provides planning information to the network administrator to configure the bridge correctly for the network. This chapter contains detailed descriptions of installation and configuration parameters, charts showing default values and value ranges, and examples of Configuration Program panels.

This chapter also contains a blank Bridge Planning Chart and instructions for completing the chart. The network planner or administrator uses the chart to locate the bridge physically in the network and to specify the values for the bridge installation and configuration parameters.

Chapter 3 describes the installation of bridge hardware and software. This chapter explains how to use the Installation Program to copy the Bridge Program and related files and build the CONFIG.SYS file onto a working diskette or fixed disk. It also explains how to use the Configuration Program to alter default configuration parameters for the Bridge Program.

Chapter 4 explains how to load the Bridge Program and how to use the panels, functions, and information available to the Bridge Program operator.

Chapter 5 provides guidance for problem determination.

Appendix A describes the messages and status information displayed by the Bridge Program.

Appendix B contains the statements necessary to edit the CONFIG.SYS file for a fixed disk or a working diskette.

Appendix C contains information that the network administrator or planner needs to know to assign values to some of the Bridge Program configuration parameters (such as single-route broadcast) and to evaluate bridge performance. This appendix also contains

instructions for filling out the Bridge Performance Analysis Worksheet and the Bridge Performance Analysis Calculations Worksheet.

Appendix D contains blank Bridge Performance Analysis Worksheets used for obtaining the performance counter values. The network administrator can use the worksheets, the bridge performance counters, and the instructions in Appendix C to evaluate the flow of traffic through the bridge.

Appendix E contains License Information and a Statement of Service, and describes the program specifications and the operating environment for the Bridge Program.

Related Publications

If you are not familiar with the computer in which you will run the Bridge Program, refer to the publications for that computer before proceeding with the Bridge Program installation.

Publications related to the computers, adapters, the IBM Token-Ring Network, the IBM PC Network, and NetView* include:

Computer Publications

- *Quick Reference* manuals for IBM PS/2 computers
- *IBM Personal System/2 Hardware Maintenance and Service*
- *IBM Personal System/2 Hardware Maintenance Reference.*

Disk Operating System (DOS) Manuals

- *DOS User's Guide*
- *DOS Reference*
- *Disk Operating System Technical Reference*

Note: Use DOS 3.3 or later to install and operate the Bridge Program.

PC Network Adapter Publications

- *IBM PC Network Adapters Technical Reference,* S68X-2265
- *IBM PC Network Baseband Adapter/A Installation Instructions* (packaged with the baseband Adapter/A)
- *IBM PC Network Adapter II/A Installation Instructions* (packaged with Adapter II/A and cable)
- *IBM PC Network Adapter II/A - Frequency 2 Installation Instructions* (packaged with Adapter II/A - Frequency 2)
- *IBM PC Network Adapter II/A - Frequency 3 Installation Instructions* (packaged with Adapter II/A - Frequency 3 and cable).

Token-Ring Network Adapter Publications

- *IBM Token-Ring Network Adapter/A Installation and Testing Instructions* (packaged with Adapter/A and diskette)
- *IBM Token-Ring Network Adapter/A Supplement* (Adapter/A Hardware Maintenance Service and Reference sections packaged with a diskette and a wrap plug)
- *IBM Token-Ring Network 16/4 Adapter/A Installation and Testing Instructions* (packaged with Adapter/A and diskette).

Network Publications

PC Network Publications

- *IBM PC Network Broadband Planning Guide*, S68X-2268
- *IBM PC Network Baseband Planning Guide*, S68X-2269
- *IBM PC Network Hardware Maintenance and Service*, S68X-2240
- *IBM PC Network Translator Unit and Cabling Options Technical Reference*, S68X-2228.

Token-Ring Network Publications

- *IBM Token-Ring Network Introduction and Planning Guide*, GA27-3677
- *IBM Token-Ring Network Problem Determination Guide*, SX27-3710
- *IBM Token-Ring Network Installation Guide*, GA27-3678
- *IBM Token-Ring Network Telephone Twisted-Pair Media Guide*, GA27-3714
- *IBM Token-Ring Network Architecture Reference*, SC30-3374.

Local Area Network Publications

- *IBM Local Area Network Administrators Guide*, GA27-3748
- *IBM LAN Manager User's Guide*, Version 1.0
- *IBM LAN Manager User's Guide*, Version 2.0

- *IBM Local Area Network Host Information*, GC30-3479
- *IBM Local Area Network Technical Reference.*

NetView Publications

- *NetView Resource Alerts Reference*, SC31-6024.

How to Obtain IBM Publications

Requests for IBM publications should be made to your IBM representative or to the IBM branch office serving your region. You may also contact the place where you purchased the Bridge Program.

Using This Manual

When you use this manual, read the section you are using completely before trying to perform the task. Make sure you are familiar with the tasks to be performed before you start.

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Chapter 1. Introduction

The IBM PC Network Bridge Program (Bridge Program)

The IBM PC Network Bridge Program (Bridge Program) enables communication between devices that are connected to different LAN segments. A LAN segment is either a ring of an IBM Token-Ring Network or a bus of a broadband or baseband IBM* PC Network*. The Bridge Program connects broadband or baseband PC network segments and token-ring network segments operating at 4 or 16 Mbps. Broadband PC Network segments can use the same or different frequency pairs.

Specifically, the Bridge Program connects two LAN segments, such as:

- Two broadband IBM PC Network segments using the same or different frequency pairs
- Adapters using different frequency pairs on the same broadband IBM PC Network segment
- One IBM Token-Ring Network segment operating at either 4 or 16 Mbps and one broadband IBM PC Network segment
- Two IBM Token-Ring Network segments operating at either 4 or 16 Mbps
- Two baseband IBM PC Network segments
- One IBM Token-Ring Network segment and one baseband IBM PC Network segment
- One broadband IBM PC Network segment and one baseband IBM PC Network segment.

  See Figure 1-1 on page 1-2, Figure 1-2 on page 1-2, Figure 1-3 on page 1-3, and Figure 1-4 on page 1-3 for illustrations of these networks.

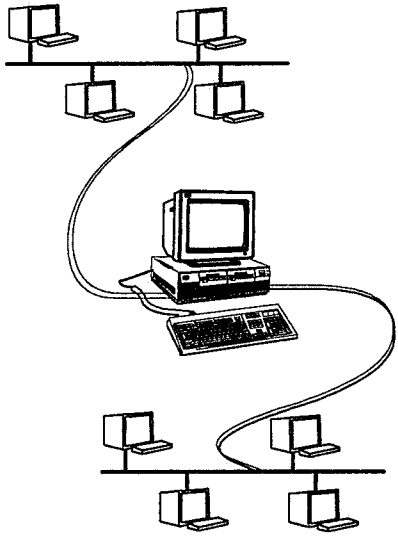

Figure 1-1. Bridge Computer Connecting Baseband and Broadband IBM PC Network Segments

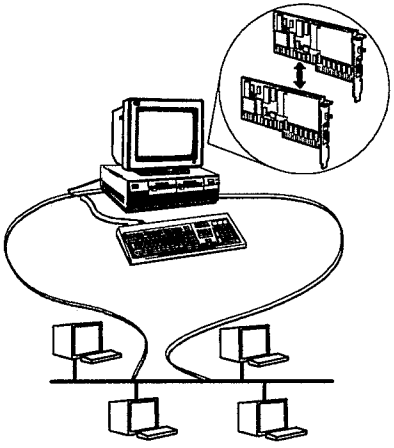

Figure 1-2. Bridge Computer Connecting a Broadband IBM PC Network Segment

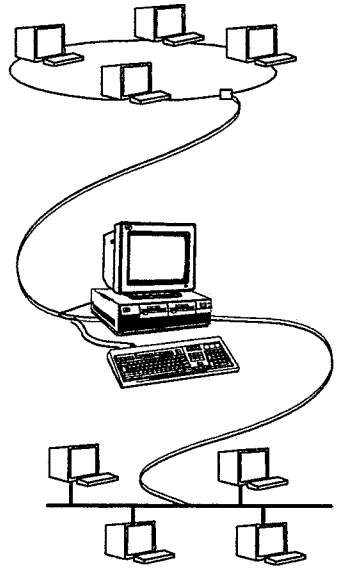

Figure 1-3. Bridge Computer Connecting Token-Ring Network and PC Network Segment

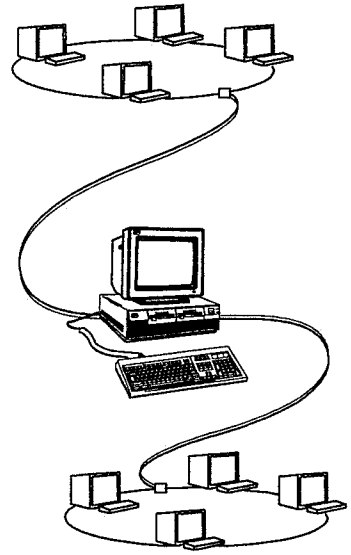

Figure 1-4. Bridge Computer Connecting Two IBM Token-Ring Network Segments

The Bridge Program also supports communication with up to four IBM LAN Manager programs. You can use the IBM LAN Manager through a link with the bridge to change some bridge configuration parameters. The IBM LAN Manager can receive bridge error messages, alerts, and LAN segment status. See "Using the Bridge Program with the IBM LAN Manager" on page 2-2 and the *IBM LAN Manager User's Guide* for more information about bridge management.

The following terms are used throughout this book:

bridge — A functional unit that connects two LANs that use the same logical link control (LLC) procedure but may use different medium access control (MAC) procedures.

A bridge consists of the bridge computer, two adapters and their cables, and the Bridge Program. "What You Need" on page 1-6 lists the hardware and software needed to support the Bridge Program.

Bridge Program — The IBM PC Network Bridge Program.

bridge computer — The dedicated computer in which the Bridge Program is loaded.

LAN segment — Any portion of a LAN (for example, a single ring or bus) that can operate independently but is connected to the establishment network via bridges, controllers, or gateways.

The Bridge Program connects two LAN segments that are either single rings of an IBM Token-Ring Network or buses of a broadband or baseband IBM PC Network.

Notes:

1. All references in this manual to the IBM PC Network refer to the broadband and baseband IBM PC Network.
2. All references in this manual to the IBM LAN Manager program refer to **all versions** of the IBM LAN Manager, unless specific versions are listed.

3. All references in this manual to the IBM Token-Ring Network Adapter/A also refer to the IBM Token-Ring Network 16/4 Adapter/A.
4. All references in this manual to token-ring network segments and PC network segments refer to IBM products.

Packaged with the Bridge Program are two additional programs:

- An Installation Program to allow you to install the Bridge Program on one or more bridge computers
- A Configuration Program to allow you to configure the Bridge Program to the needs of your network.

The computer in which the Bridge Program is loaded is a **dedicated** machine and cannot be used for any other operation while performing as a bridge. For example, you cannot load the IBM LAN Manager while the Bridge Program is running in the same computer.

Using the Bridge Program with the IBM PC Network

If your network includes the IBM PC Network, use the *IBM PC Network Broadband Planning Guide* or the *IBM PC Network Baseband Planning Guide* to help you determine the need for using the Bridge Program, or talk to your professional network designer or installer.

Appendix C will help you to assign values to some of the Bridge Program configuration parameters to configure the bridge to meet the needs of your network.

Note: Workstations on a PC Network segment connected by a bridge will require the IBM Local Area Network Support Program Version 1.0 or higher.

Using the Bridge Program with the IBM Token-Ring Network

If your network includes the IBM Token-Ring Network, use the information provided in the *IBM Token-Ring Network Introduction and Planning Guide* to help you determine the need for using the Bridge Program.

In addition, see the *IBM Local Area Network Administrator's Guide* to understand some of the following network considerations:

- Assigning values to some of the Bridge Program installation and configuration parameters, such as Early Token Release (ETR) and single-route broadcast, to change the characteristics of the bridge to meet the needs of your network
- Assigning IBM LAN Manager roles (such as controlling or observing) in relation to the bridge
- Deciding which bridges communicate with which IBM LAN Manager programs in your network.

  For more information about using the IBM LAN Manager in your network, see the *IBM LAN Manager User's Guide*.

Appendix C helps you assign values to some of the Bridge Program installation and configuration parameters, such as ETR and single-route broadcast, to configure the bridge to meet the needs of your network.

Contents of the Package

The Bridge Program package contains:

- One IBM PC Network Bridge Program Diskette (3.5-inch)
- This *User's Guide*.

If any item is missing or defective, return the package to your IBM representative or authorized dealer.

What You Need

Computer Equipment and Supplies

To install and operate the Bridge Program, you need:

- An IBM Personal System/2* (PS/2*) computer with Micro Channel* architecture and the following
  - At least 512 KB of memory

- A minimum of one 720 KB diskette drive or one 1.44 MB diskette drive with at least 300 KB of free disk space
- Two network adapters that are compatible with your computer (see Table 1-1) and their cables
- A display that is compatible with your computer (one of the following)
  - An IBM monochrome display
  - An 80-column color monitor
- An IBM PC Graphics Printer, or its equivalent, if you want printer output

- At least two blank 3.5-inch diskettes.

Refer to Table 1-1 to determine the type of adapters you will be installing in the bridge computer.

Table 1-1. Network and Adapter Combinations

Type of Network	**Name of Adapter**
Token-Ring Network	Token-Ring Network Adapter/A Token-Ring Network 16/4 Adapter/A
PC Network	PC Network Adapter II/A PC Network Adapter II/A - Frequency 2 PC Network Adapter II/A - Frequency 3 IBM PC Network Baseband Adapter/A

For more information concerning computer equipment and supplies see "Related Publications" on page ix.