

IBM LAN Manager User's Guide

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Note: This product is intended for use within a single establishment and within a single, homogeneous user population. For sensitive applications requiring isolation from each other, management may wish to provide isolated cabling or to encrypt the sensitive data before putting it on the network.

Second Edition (March 1989)

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About This Book

The IBM LAN Manager is a network management program and problem determination aid for a Local Area Network (LAN) composed of one or more IBM Token-Ring Networks and broadband IBM PC Networks. It runs under OS/2¹ Extended Edition Version 1.1, and can communicate with the NetView² program at a host. This manual explains how to install and operate the IBM LAN Manager

How to Use This Book

In this book you will find instructions for installation, and information about other tasks.

After installation, go to the Table 5-1 on page 5-3 for information regarding specific tasks.

Installing and Defining the IBM LAN Manager

Chapter 1, Hardware and Software Requirements

Describes the LAN Manager and gives general information about using it.

Chapter 2, Overview of the IBM LAN Manager

Defines terms used frequently in this book and gives you a quick functional overview of the LAN Manager.

Chapter 3, System Definition

Describes how to define important system parameters for the LAN Manager. The network administrator should read this chapter before installation, and fill out the worksheets found in Appendix D, Worksheets.

Chapter 4, Installing the LAN Manager

Describes how to install the LAN Manager and prepare your system for operation.

¹ OS/2 is a trademark of International Business Machines Corporation.

² The NetView program is a host-based network management tool from IBM. NetView is a trademark of IBM.

LAN Manager Functions

The chapters in this part of the book contain reference material for persons operating the LAN Manager.

- Chapter 5, Introduction to LAN Manager Functions
Describes the LAN Manager functions and how to use the LAN Manager after you have installed it.
- Chapter 6, Alert Function
Describes the LAN Manager Alerts functions.
- Chapter 7, Event Log Functions
Describes the LAN Manager Event Log functions.
- Chapter 8, Adapter Functions
Describes the LAN Manager Adapter functions.
- Chapter 9, Bridge Functions
Describes the LAN Manager Bridge functions.
- Chapter 10, Network Functions
Describes the LAN Manager Network functions.
- Chapter 11, Other LAN Manager Functions
Describes other LAN Manager functions.
- Chapter 12, Basic Troubleshooting
Describes helpful hints about using the LAN Manager to troubleshoot the network.

Appendixes

- Appendix A, LAN Manager Messages
Briefly discusses LAN Manager messages.
- Appendix B, Table of LAN Manager Functions
Provides a table of LAN Manager functions and the page numbers for the descriptions of each function.
- Appendix C, License Information
Contains the License Information and Statement of Service for the LAN Manager.
- Appendix D, Worksheets
Contains worksheets that may be useful in recording your system parameters for operation, defining an adapter definition, or defining a bridge definition. You should make

copies of these worksheets and retain the originals in the binder.

Appendix E, Alert Transport Service

Describes how application programs can send alerts through the LAN Manager to a NetView host.

Appendix F, Bridge Performance Analysis

Describes the bridge performance information available at the IBM LAN Manager Version 2.0. It explains how to use the performance information to evaluate and manage bridge traffic flow.

You will also find a list of abbreviations, a glossary and an index following the appendixes.

Users of This Manual

The network *administrator* or *planner* uses this manual to learn how to enter data concerning the configuration of the network. This book can be used to train network operators and to resolve problems on the network.

The *operator* of the LAN Manager uses this manual to perform the following tasks:

- Monitor the status of attaching devices on the LAN segments
- Test the path between adapters
- List all active adapters on the LAN segments
- Cause the LAN Manager to generate alerts when selected adapters leave the network
- Create reports that include information about errors and configuration changes on the LAN segments.

Prerequisite Knowledge

You should be familiar with the IBM Token-Ring Network or the broadband IBM PC Network, as appropriate.

Knowledge of the supported IBM Personal Computers or the supported models of the IBM PERSONAL SYSTEM/2[®] computer and the Operating System/2³, Extended Edition, Version 1.1 (OS/2 EE 1.1) is also helpful.

Prerequisite Publications

IBM Token-Ring Network Introduction and Planning Guide, GA27-3677

IBM Token-Ring Network Administrator's Guide, GA27-3748

IBM Token-Ring Network Problem Determination Guide, SX27-3710 (required for IBM Token-Ring Network problem determination)

IBM PC Network Hardware Maintenance and Service (required for IBM PC Network problem determination)

Related Publications

IBM Cabling System Planning and Installation Guide, GA27-3361

IBM Token-Ring Network Installation Guide, GA27-3678

IBM Token-Ring Network Architecture Reference, SC30-3374

IBM Token-Ring Network Bridge Program User's Guide for the appropriate version

IBM PC Network Bridge Program User's Guide

IBM PC Network Technical Reference

IBM PC Network Broadband Planning Guide, S68X-2268

³ Operating System/2 is a trademark of International Business Machines Corporation.

IBM Local Area Network Technical Reference

IBM Local Area Network Administrator's Guide

Publications Related to Your Computer

The operator's guide for the computer.

Hardware Maintenance Service

Hardware Maintenance Reference

Technical Reference

Operating System/2 Extended Edition Version 1.1 Command Reference

Operating System/2 Extended Edition Version 1.1 User's Guide

Operating System/2 Extended Edition Version 1.1 System Administrator's Guide for Communications

Publications Related to Network Adapters

Operator's guide

Installation Instructions

Technical Reference

Other Publications

IBM NetView Operation, SC31-6019

How to Get 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 IBM LAN Manager.

Summary of Changes

The following new functions and enhancements are available when running the IBM LAN Manager, Version 2.0:

- Migration from DOS to OS/2
 - Memory protection for the LAN Manager. This function provides an operational environment in which undefective software is protected from defective software.
 - Usable memory of up to 16 MB, depending upon the model of the supporting workstation.
 - Multiple applications may operate concurrently.
 - Communications to the host for alerts and Service Point Command Service (SPCS) can now be over the LAN, through the OS/2 Communications Manager facility.
- Management of a combination of IBM Token-Ring and PC Network LAN segments on the same local area network (mixed LAN).
- Support for 16 Mbps IBM Token-Ring Network adapters.
- Monitoring of critical resources on **any** LAN segment, generating an alert when a monitored adapter is not present on the network.
- Enhanced alert functions, with alerts for the following new conditions:
 - Loss of a critical resource on a token-ring LAN segment
 - Downstream converter presence frame is received from the intelligent repeater. The frame is sent when the token-ring backup path wraps to the main ring path
 - Token-ring backup path is beaconing
 - Handling of alerts sent to the LAN Manager by other stations on the network (Alert Transport Service)
 - Unauthorized presence of the trace tool on the network.
- In addition to single-route broadcast, you can now change additional bridge parameters such as hop count, link passwords, and others from the LAN Manager itself, without going to the bridge console.

- Prohibiting unauthorized IBM Token-Ring Trace and Performance Program frame tracing activity by limiting access to a specified list of trace adapter addresses
- Importing of an ASCII adapter names file into the LAN Manager adapter names file, and export the LAN Manager adapter names file to an ASCII file
- Support of generic alerts, in which the alerts can be viewed at either the LAN Manager or at a NetView host terminal
- Provide Service Point Command Services (SPCS) for the execution of a subset of LAN Manager functions through commands from a NetView host
- Log performance counters from the bridges to a separate file, not part of the event log
- Support of optical fiber repeater.

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Installing and Defining the IBM LAN Manager

Chapter 1. Hardware and Software Requirements

This chapter provides:

- A description of the contents of the LAN Manager package
- A list of equipment and materials you will need to operate the LAN Manager.

Contents of the LAN Manager Package

The IBM LAN Manager package includes:

- • This manual
- • A reference card showing panel flows, alerts, user tasks and key usage
- • Two 5.25-inch (1.2 MB) IBM LAN Manager diskettes
- • One 3.5-inch (1.44 MB) IBM LAN Manager diskette.

What You Need

This list details the hardware and software requirements for the LAN Manager.

Computer Hardware

- IBM computer (one of the following choices):
 - IBM PERSONAL COMPUTER XT¹ Model 286
 - IBM PERSONAL COMPUTER AT[®]
 - IBM PERSONAL SYSTEM/2[®] (PS/2[®]) Model 50, Model 60, Model 70, or Model 80.
- Memory: There must be at least 800 KB of virtual memory available to the LAN Manager.
- Fixed disk: One fixed disk with a minimum of 2.6 MB of available space.
- One diskette drive (any of the following):
 - 5.25-inch drive (1.2 MB)
 - 3.5-inch drive (1.44 MB).
- Display: A display, either monochrome or color, supported by the IBM Operating System/2² (OS/2³) Extended Edition (EE), Version 1.1.
- Printer: (*Optional*) Any printer supported by OS/2 EE, Version 1.1.

¹ IBM Personal Computer XT is a trademark of International Business Machines Corporation.

² Operating System/2 is a trademark of International Business Machines Corporation.

³ OS/2 is a trademark of International Business Machines Corporation.

Network Hardware

The computer in which you install the LAN Manager can be attached to either type of LAN segment: IBM Token-Ring Network or broadband IBM PC Network. This section lists the various adapters that are available for installation in the LAN Manager's computer. There are two lists of adapters, one for each type of LAN segment. Select the appropriate adapter from either list; you do not need adapters from both lists.

Note: Not all adapters that you can install as the LAN Manager's adapter support linking to 64 bridges. A LAN Manager adapter must have at least 16 KB of memory to support a maximum of 64 bridges. LAN Manager adapters with 8 KB of memory can link to a maximum of 32 bridges. Refer to your adapter documentation for memory specifications.



Your computer must be connected to the IBM Token-Ring Network. You should have already installed one of the following:

- IBM Token-Ring Network PC Adapter
- IBM Token-Ring Network PC Adapter II
- IBM Token-Ring Network Adapter/A
- IBM Token-Ring Network 16/4 Adapter
- IBM Token-Ring Network 16/4 Adapter/A.

Note: In this book, when discussing an IBM Token-Ring Network LAN segment, the term *adapter* will refer to any of these adapters unless indicated otherwise.

To connect the adapter to the network, you need to see the operator's guide packaged with the adapter.

PC Network

Your computer must be connected to the broadband IBM PC Network LAN segment. You should have already installed one of the following adapters:

- IBM PC Network Adapter II
- IBM PC Network Adapter II/A
- IBM PC Network Adapter II - Frequency 2
- IBM PC Network Adapter II/A - Frequency 2
- IBM PC Network Adapter II - Frequency 3
- IBM PC Network Adapter II/A - Frequency 3.

In this book, when discussing a broadband IBM PC Network LAN segment, the term *adapter* will refer to any of these adapters unless indicated otherwise.

To connect the adapter to the network, you need to see the installation instructions packaged with the adapter.

Software

- Operating System: IBM Operating System/2 (OS/2) Extended Edition Version 1.1.
- For a multi-LAN-segment network, if the LAN Manager is to manage the remote LAN segments, one or more of the following bridge programs is needed:
 - IBM Token-Ring Network Bridge Program, Version 2.1 (ring to ring)
 - IBM Token-Ring Network Bridge Program, Version 2.0 (ring to ring)
 - IBM Token-Ring Network Bridge Program, Version 1.1 (ring to ring)
 - IBM PC Network Bridge Program Version 1.0 (bus to bus, bus to ring).
- For connection to a host, you will need one of the following programs:
 - IBM NetView ⁴, Release 3.0, to send alerts to the host and receive SPCS commands from the host (using the communication facilities of OS/2 or NetView/PC ⁴, Version 1.2)
 - IBM NetView, Release 2.0, to send alerts only to the host (using the communication facilities of OS/2 or NetView/PC, Version 1.2).

⁴ NetView and NetView/PC are trademarks of International Business Machines Corporation.

Chapter 2. Overview of the IBM LAN Manager

This chapter defines terms used frequently in this book and gives a brief functional overview of the LAN Manager.

Terms Frequently Used in This Book

The following terms are used frequently throughout this book.

- | | |
|--------------------|---|
| bus | The broadband IBM PC Network is referred to as a <i>bus</i> . |
| ring | A single- or multi-ring IBM Token-Ring Network is referred to as a <i>ring</i> . |
| LAN segment | Either a ring or a bus. |
| network | Refers to a network managed by the LAN Manager comprised of one or more IBM Token-Ring LAN segments, or broadband IBM PC Network LAN segments. In a network with multiple LAN segments, the following bridges are used to connect LAN segments: <ul style="list-style-type: none">• IBM Token-Ring Network Bridge Program, Version 1.1, 2.0 or 2.1. These programs connect two rings.• IBM PC Network Bridge Program, Version 1.0. This program connects two buses or a bus to a ring. |

The IBM LAN Manager enables you to manage a local area network, by performing the following functions:

- Maintain network records
- Monitor network status
- Determine the source of problems in the network.

The local area network may consist of any of the following network types:

- IBM Token-Ring Network
- Broadband IBM PC Network
- Mixed LAN (combination of both network types).

The LAN Manager manages both the LAN segment to which its adapter is attached and remote LAN segments connected by bridge programs. The LAN Manager reports errors on the LAN segment to which its adapter is attached, and receives error reports about remote LAN segments from the linked bridges on those LAN segments.

You need a LAN Manager for each local area network (LAN) that you wish to manage. Depending on the number of bridges and segments in the network, you may need more than one LAN Manager for the network.

The LAN Manager can manage up to 65 LAN segments linked by up to 64 bridges at a time. You may have more than 64 bridges in the network, but you will need more than one LAN Manager to manage them.

LAN Manager Functions

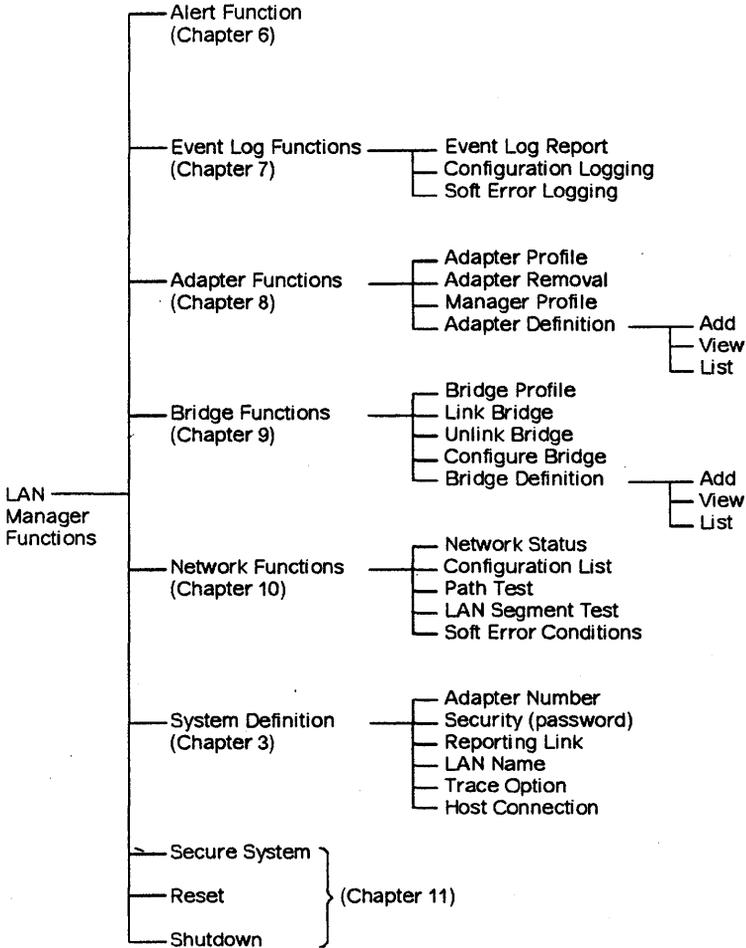


Figure 2-1. LAN Manager Functions

Alert Function

An *alert* is a notification of a security violation on the network or of an interruption or a potential interruption in the flow of data around the network. The loss may have already occurred, or may be imminent. For example, a print server is considered by a particular work group to be a critical resource on the network. Accordingly, the print server

should be *monitored* by the LAN Manager. If the print server's adapter is lost from the network, an alert is generated by the LAN Manager.

Event Logging and Reporting

The LAN Manager logs the following types of network events:

- Configuration changes
- Alerts
- Invalid frames
- Soft errors
- Notifications (such as "Network recovered").

You can turn configuration logging on or off for all LAN segments, or for a single LAN segment. You can enable or disable soft error reporting for each LAN segment in the network.

You can retrieve logged events for reporting by one or more of the following categories:

- Date and time
- Adapter name
- Adapter address
- LAN segment number
- Message number
- Bridge name.

Adapter Functions

The options under **Adapter Functions** allow you to perform the following:

- Add an adapter definition
- Remove an adapter from the network
- Query an adapter profile on the network.

Each computer in a LAN has an *adapter* to interface with the network. You add an adapter definition for each adapter that is to be recognized by the LAN Manager by name. An *adapter definition* consists of the following information:

- Adapter name
- Adapter address
- Whether the adapter is to be monitored
- Comments about the adapter.

The monitoring of an adapter begins when the LAN Manager is started or when an address is defined as monitored, using **Adapter Definition**. When the LAN Manager *monitors* an adapter, it generates an alert if any of the following conditions occurs:

- The adapter leaves the network or does not respond to the LAN Manager.
- The adapter is not currently active on the network when monitoring begins.

When a monitored adapter does enter the network, a message is recorded in the event log but no alert is generated. You would normally want to monitor critical adapters, such as a file server or a print server.

Note: You can monitor up to 1,000 adapters at a time.

If you delete a monitored adapter from the adapter definition list, or remove the monitored adapter indicator, alerts will no longer be generated when that adapter leaves the network.

Removing the monitored adapter indicator from the adapter definition:

- Does not remove the adapter from the network
- Does not delete the name of the adapter from the adapter definition file.

You can also display (query) any adapter's profile and remove any adapter from the network. A sample adapter profile for an adapter on a Token-Ring LAN segment is shown in Figure 8-2 on page 8-2.

You can specify the adapter profile by giving the adapter name or address. You can specify, in addition, the LAN segment on which the adapter is located. However, if you omit the LAN segment, the LAN Manager will search all LAN segments for adapters that fit the conditions of the query.

Bridge Functions

A *bridge* is a logical and physical connection between two LAN segments. A bridge consists of a dedicated computer which has two separate adapters, one for each LAN segment. The bridge computer runs a bridge program which handles the passing of information from one LAN segment to the other and the processing of LAN management frames.

The options under **Bridge Functions** allow you to do the following:

- Add, change or delete a bridge definition
- Change a bridge's configuration parameters
- Link a bridge
- Unlink a bridge
- Query a bridge profile.

A *bridge definition* consists of the following information:

- Bridge name
- Bridge number
- Whether the bridge is to be linked automatically to the LAN Manager at bringup (start or reset of the LAN Manager)
- The LAN segment number, for each LAN segment attached to the bridge
- The adapter name or address, for each LAN segment attached to the bridge.

Bridge configuration parameters include the following:

- Bridge number
- LAN segment connected to each adapter
- Frame forwarding active
- Performance notification interval
- Percent frame lost threshold
- Hop count limit
- Single-route broadcast
- Link passwords.

Network Functions

The LAN Manager provides the following Network Functions:

- Network status
- Configuration list
- Path test
- LAN segment test
- Soft error conditions.

Network status allows you to display the status of all LAN segments in the network that are being monitored by the LAN Manager.

The network status display includes the following information:

- LAN segment number
- LAN segment status. Possible status conditions are:
 - Normal
 - Soft error
 - Beaconsing
 - Continuous carrier.

See Table 10-1 on page 10-4 for a full description of each status condition.

- Bridge names linked to the segment.

An asterisk (*) beside the LAN segment number identifies the *local LAN segment*. The local LAN segment is the segment in which the LAN Manager is running. Those segments that are linked to the local LAN segment through bridges are called *remote LAN segments*.

System Definition

The **System Definition** functions allow you to set various system parameters:

- Adapter number
- Security
- Reporting link
- LAN name
- Trace option
- Host connection.

The *adapter number* specifies whether the LAN Manager uses the primary or alternate adapter. The *security* function allows you to set the password for access to the LAN Manager.

The *reporting link* specifies the reporting link number and password used when the LAN Manager links with bridges. The *LAN name* is the name you assign to the local area network being managed by the LAN Manager.

The *trace option* allows you to control which adapters can perform tracing. You can allow all adapters, no adapters, or a list of adapters to perform tracing.

Note: The IBM LAN Manager can only limit tracing by the IBM Trace and Performance Program, or a tracing program that follows the same architecture.

The *host connection* function allows you to select whether and how the LAN Manager communicates with a host. You can select the following types of host connection:

- OS/2
- NetView/PC
- None.

Secure System

The **Secure System** function allows you to protect the LAN Manager from unauthorized access. Once the system has been secured, an operator must enter the password to access LAN Manager functions.

Secure System only locks operator access. The LAN Manager continues running, with no interruption in such operations as alerts logging and processing of commands received from a host.

Reset

The **Reset** function terminates operation of the LAN Manager, and then restarts it. Any prior configuration changes (such as changes in reporting link number or LAN name) take effect when the LAN Manager restarts.

Shutdown

The **Shutdown** function terminates operation of the LAN Manager and returns control to OS/2.

Host Communication Capabilities

When the LAN Manager has communication with a NetView host¹ the LAN Manager can forward alerts to the host and receive Service Point Command Service (SPCS) commands from the host. These alerts may be LAN alerts, or may be generated by applications on the network. The commands from the host enable the host NetView operator to do the following:

- Obtain a bridge profile
- Obtain the current status of all the managed LAN segments in the network
- Obtain a list of all active stations on a LAN segment.

¹ Communication is a function of OS/2 EE, or the host communication function of NetView/PC. The host connection option is specified in the **System Definition** function.

- Request a path test between two stations on the network
- Request a LAN segment test
- Obtain an adapter profile
- Remove an adapter
- Establish a communication link between the LAN Manager and a bridge
- Remove a communication link between the LAN Manager and a bridge
- Change parameters in a bridge that is linked to the LAN Manager
- Reset the LAN Manager.

The LAN Manager also sends responses (to SPCS commands) to NetView. The responses are in the form of messages. The message explanations can be viewed at NetView the same as any messages originated by NetView.

LAN Segment Status

The status condition of the LAN Manager and the LAN segment to which the LAN Manager is attached (the *local* LAN segment) is displayed in the upper left corner of each panel below the panel ID. In the example below, the status of the local LAN segment is **Normal**.

```
DFIPCP10  
Normal
```

```
IBM LAN MANAGER  
LAN Manager Functions
```

Select one of the following and press **Enter**.

When the status changes, you will receive messages either in the form of alerts or error messages displayed on your screen or in the event log. These messages and alerts give you more information about what may have caused the status to change. The LAN Manager stores messages in the event log and you can display them using the **Event Log** function. Use the **Alert** function to display alert information. Messages are also described briefly in Appendix A, LAN Manager Messages.

Note: You can display the status of remote LAN segments by using the **Network Status** function.

Status information is required when troubleshooting the network. Refer to the *IBM Token-Ring Network Problem Determination Guide* and the *IBM PC Network Hardware Maintenance and Service* manual. The **Network Status** information, however, changes only when automatic error recovery has failed to resolve the problem on the network, and should not be used to determine the LAN segment status when following problem determination procedures.

See Table 10-1 on page 10-4 for a list of possible network status conditions. These status conditions apply to both the local and remote LAN segments. For additional status conditions that only apply to the LAN Manager, see Table 12-1 on page 12-2.

Operating the LAN Manager

This section gives you an overview of operating the LAN Manager. Topics covered are:

- Making selections on LAN Manager panels
- Using special keys
- Getting Help.

Making Selections

A *menu* is a list of available functions on a panel. On a menu, either type the number that corresponds to the function you want, or press the arrow keys to move the cursor to the function you want, and press **Enter**.

Some functions display a list of items, such as bridge definitions, and display the actions you can perform near the top of the panel. On those panels, move the cursor next to the list item you want and type the letter that represents the action; then press **Enter**.

Use the LAN Manager reference card to see the panel sequences for each function. The reference card also contains a capsulized description of each special key or key sequence described below.

Special Keys

Function keys are the set of keys indicated by "F" and a number. They have been assigned special instructions as indicated in the following list.

- | | |
|--------------------|--|
| F1 (Help) | Requests the appropriate Help panel to be displayed. |
| F3 (Exit) | Cancels any input on this panel and returns you to the LAN Manager Functions panel. |
| F4 (Toggle) | Toggles between two displays of data or two lists sequenced differently. |

- F5 (Refresh)** On a panel that allows data entry, **F5** cancels any input on the panel and allows you to start again to enter new input.
- On a panel that is display only, **F5** clears the screen and then fills it with updated information.
- When using **Network Status** to do problem determination, Press **F5** to determine current status on remote LAN segments.
- F6 (Query)** Queries an adapter on the network.
- F7 (Remove)** Removes an adapter from the network.
- F8 (Print)** Creates a print file that can be viewed with an ASCII editor or printed using the PRINT command in OS/2.
- F9 (Delete)** Erases items from a file.

The functions assigned to the other F keys vary with the panel on which they appear.

Several other special keys are defined in the following list:

- Esc (Cancel)** Terminates the current operation and returns you to the panel from which you chose the current panel.

Scrolling keys allow you to read all of the information provided, even though it may exceed one panel, or to go to the beginning or end from any location:

- PgUp** Page Up allows you to see the previous panel.
- PgDn** Page Down allows you to see the next panel.
- Home** The **Home** key allows you to see the first panel of the data you are currently viewing. On a data entry panel, the **Home** key returns you to the first data entry field.
- End** The **End** key allows you to see the last panel of the data you are currently viewing.

Pre-established key sequences:

Ctrl-Alt-Del Press and hold Control (**Ctrl**) and Alternate (**Alt**) and Delete (**Del**).

Ctrl-Alt-Del restarts the entire computer. Therefore, you should shut down the LAN Manager before you press **Ctrl-Alt-Del**.

Alt-Esc This key combination is an OS/2 function. It switches you from one active OS/2 sessions to another, in the order in which they were started.

Ctrl-Esc This key combination is an OS/2 function. It returns control to the OS/2 Task Manager.

Getting Help

If you need information about a specific panel of the LAN Manager, press **F1 (Help)** on that panel.

1. Press **F1 (Help)** to view the Help panel.
2. Press **Enter** to view the next Help panel, if there is one.
3. Press the Escape (**Esc**) key to leave any Help panel and return to the current system panel.

Chapter 3. System Definition

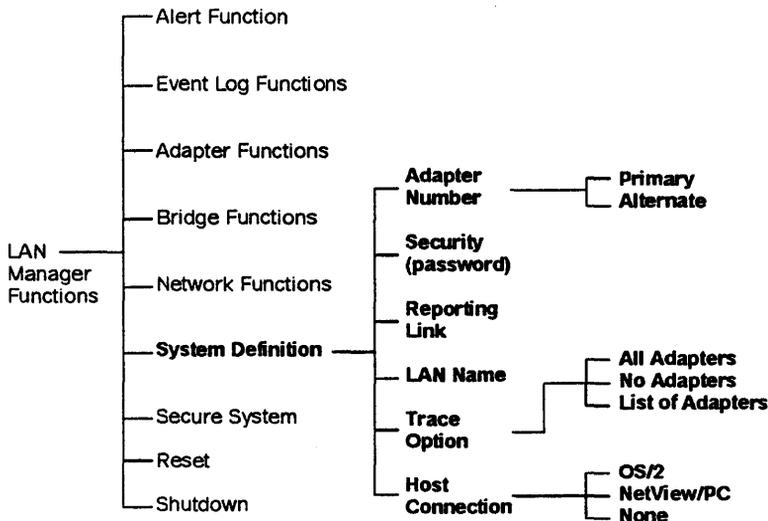


Figure 3-1. System Definition Functions

This chapter is directed toward two persons: the network administrator and the person who will install and set up the initial system definition of the LAN Manager. Those portions of text that require planning by the network administrator are marked with shaded boxes in the margin.



The network administrator should read this entire chapter *before* the LAN Manager is installed. It is suggested that you first read the entire chapter to familiarize yourself with its content. During your second reading, you should fill out the accompanying worksheets in Appendix D, Worksheets. Once the worksheets have been completed, give them to the network operator. The worksheets will help make the initial system definition run more smoothly.



Refer to this chapter, as needed, during the initial system definition that you will perform after installing the LAN Manager.

Choose **System Definition** to use any of the following functions:

<i>Function</i>	<i>Default</i>
Adapter Number	0
Security (password)	All blanks
Reporting Link	Reporting link number = 0; reporting link password = 00000000
LAN Name	All blanks
Trace Option	All
Host Connection	None

This section describes each function and suggests when to use it.

Adapter Number

Choose **Adapter Number** to do the following:

- Check whether the adapter number has been set correctly
- Change the adapter number.

The adapter number specifies whether the adapter the LAN Manager is to use is the *primary* or *alternate* adapter in the LAN Manager's computer. The adapter number is *not* the adapter's hexadecimal address.



The network administrator should decide which adapter the IBM LAN Manager should use.

If the IBM LAN Manager should use the *primary* adapter, make sure the adapter number is set to "0."

If the LAN Manager should use the *alternate* adapter, make sure the adapter number is set to "1."

If you have changed the adapter number you must reset the LAN Manager, or shut down the LAN Manager and return to OS/2 then start the LAN Manager again, so that the change can take effect. See "Reset (Reinitialize the LAN Manager)" on page 11-2.

About Primary and Alternate Adapters:



Refer to the *IBM Token-Ring Network PC Adapter Guide to Operations* for switch settings for the following adapters:

- IBM Token-Ring Network PC Adapter
- IBM Token-Ring Network PC Adapter II
- IBM Token-Ring Network 16/4 Adapter/A.

There are no switches on the following adapters:

- IBM Token-Ring Network Adapter/A
- IBM Token-Ring Network 16/4 Adapter/A.

The primary-alternate indication is set by the configuration program on the *Reference Diskette*. The adapter diskette, which contains the adapter parameters, must first be copied to the *Reference Diskette*.



For more information on primary and alternate PC Network adapters and how the jumpers or switches on the IBM PC Network Adapter II are set, refer to the *Installation Instructions* packaged with the adapter.

There are no switches or jumpers on the IBM PC Network Adapter II/A. The primary-alternate indication is set by the configuration program on the *Reference Diskette* (created from the diskette shipped with the Personal System/2 computer).

Security (Setting the Password)

Choose **Security** to:

- Set a password when you first install the LAN Manager
- Change the password.

The operator security function of the LAN Manager allows you to make sure that only an authorized network operator has access to the functions of the LAN Manager and configuration data. For example, you can use a password to restrict the ability to remove an adapter from the network. The password secures only the LAN Manager application.

Note: It is strongly recommended that you define an operator password. You may wish to change the password often.

If you set a password, you are required to enter the password (the password you type is not displayed on the screen):

- The first time you select the LAN Manager after selecting **Shut-down**
- Whenever you reaccess the LAN Manager after selecting **Secure System**.

If you do not set a password, the **LAN Manager Functions** panel is the first panel displayed after the copyright panel when you select **IBM LAN Manager 2.0** from the **OS/2 Program Selector** panel.

If you set a password and forget what you have entered, or if you want to remove password protection, you may erase the password by using the reset procedure. See "Removing Password Protection" on page 11-2.

Reporting Link

Each bridge has four reporting links, numbered from 0 to 3. Therefore, a single bridge can communicate with up to four LAN Managers at a time. When the bridge program is configured, passwords may be entered for each reporting link. The bridge program uses these passwords to determine if a LAN Manager is authorized to establish a reporting link with the bridge.

Reporting Link Number and Password

If you want to link to one or more bridges, you must define the reporting link number and password.

The LAN Manager sends its reporting link number and password to the bridge when it links to the bridge. The bridge program performs two checks before it accepts the link:

- The reporting link password must agree with the password defined in the bridge program for this reporting link.
- The reporting link number must not be in use by another LAN Manager.

If either test fails, the link is rejected and a notification is sent to all LAN Managers linked to the bridge. An alert is sent when the passwords do not match. An alert is not sent, however, when the link number is already in use.

Each bridge can establish up to four reporting links at a time. However, a single LAN Manager can select only one reporting link number at a time. Therefore, if you want to link to multiple bridges, you must use the same reporting link number and the same password at all bridges.



The network administrator assigns the passwords to the bridge links and decides which LAN Manager is to be the controlling LAN Manager for each bridge. All other LAN Managers communicating with the bridge are observing LAN Managers.

Controlling and Observing LAN Managers

When you select a reporting link number, you also automatically define the LAN Manager as a *controlling* or *observing* LAN Manager. The associations with reporting link numbers are as follows:

- 0 Controlling (default)
- 1 Observing
- 2 Observing
- 3 Observing

The functional differences between controlling and observing LAN Managers are:

Controlling LAN Manager (default)	A controlling LAN Manager has exclusive authority to perform the following functions: <ul style="list-style-type: none">• Remove stations on the local LAN segment or on remote LAN segments (LAN segments that are connected by bridges to the LAN segment to which the LAN Manager's adapter is attached)• Set soft error logging options for remote Token-Ring LAN segments• Change bridge configuration parameters• Perform a path test• Remove unauthorized trace tools.
Observing LAN Manager	An <i>observing</i> LAN Manager cannot perform any of the preceding list of actions; those actions are reserved for a controlling LAN Manager. An observing LAN Manager can perform all other functions.

A network can have more than one controlling LAN Manager as long as the controlling IBM LAN Managers do not attempt to establish links to the same bridges.

Reporting Links and Host Communication

The reporting link setting also affects the reporting of alerts to a host. The controlling LAN Manager, when it has communication with a host, sends all network alerts to the host except those involving failures in other LAN Managers.

Any LAN Manager, however, whether controlling or observing, sends alerts related to itself, its adapter, or its bridge link failures. For example, on a Token-Ring Network LAN segment, if a LAN Manager detects that its error reporter function failed, it (and only it) sends the alert to the host.

Changing Reporting Links

If you change a reporting link number or reporting link password, the change does not take effect immediately. The change takes effect only when you restart the LAN Manager, after a **Reset** or **Shutdown**.

LAN Name

Use **LAN Name** to change the name that identifies the local area network in local alerts and alerts sent to the host. The new LAN name takes effect the next time the LAN Manager is reset or initialized.

Note: You must restart the LAN Manager to make the change take effect.

The LAN Name is used in some alerts to identify the network experiencing a failure. It can appear in the alert as the failing resource or it can be displayed at the host as part of the alert domain.

The LAN name can be up to 8 characters long in any combination of A-Z, 0-9, @, \$, %, and #.

Trace Option

Use **Trace Option** to allow or disallow the IBM Token-Ring Network Trace and Performance Program to trace frames on the network. **Trace Option** does not perform any frame tracing itself.

You can select any one of three trace options:

- Allow all adapters to trace frames (*default*)
- Allow no adapters to trace frames
- Specify list of adapters to trace frames.

If you select "specify list," you can enter a list of up to eight adapters that will be allowed to perform frame tracing.

Host Connection

Use **Host Connection** to identify the means the LAN Manager will use to communicate with a host and send alerts to a host. The setting you specify will be in effect the next time the LAN Manager is initialized or reset from the local display.

Note: Before you reset the LAN Manager, you must start the program that is used to communicate with the host (OS/2 Communication Manager or NetView/PC).

You can select any of the following **Host Connection** options:

- OS/2
- NetView/PC
- None (*default*).

If you select "OS/2," you are prompted to enter a Service Point name. A Service Point is assigned in VTAM at the host. It is the PU Name for OS/2 in the session between VTAM and OS/2. It is used to identify uniquely this LAN Manager in all alerts sent to the host.

The LAN Manager can communicate with the NetView program, Release 3.0, at a host by using the communication facility of OS/2 EE, if OS/2 EE has been configured for host communication. See the *OS/2 Extended Edition, Version 1.1 User's Guide* for details.

If you already have NetView/PC, Version 1.2, installed on the same fixed disk as the LAN Manager, the LAN Manager can use the host communication facility of NetView/PC.

You can remove host communication by specifying "None." This is the default host communication setting when the LAN Manager is installed.

The commands that can be received by the LAN Manager from the host are shown in boldface in Figure 3-2 on page 3-11.

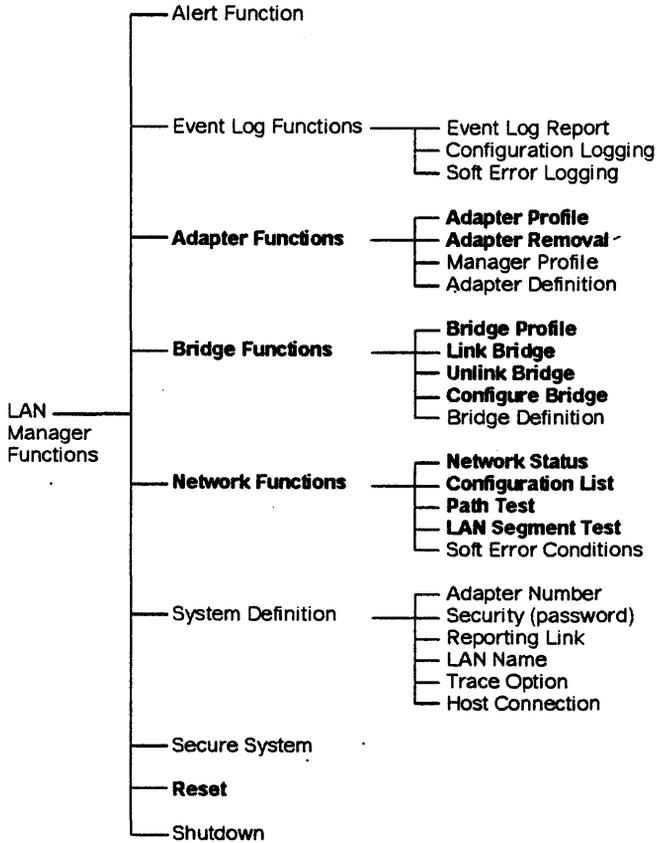


Figure 3-2. LAN Manager Functions Executable from Host. Functions in bold type can be executed from a host.

Chapter 4. Installing the LAN Manager

This chapter describes how to install the IBM LAN Manager, Version 2.0.

The procedures in this chapter are presented in the sequence in which they should be performed:

- 1** Making backup copies of your files
- 2** Installing the IBM LAN Manager Version 2.0
- 3** Migrating files from any of the following:
 - IBM LAN Manager Version 1.0
 - IBM Token-Ring Network Manager Version 1.1
 - IBM Token-Ring Network Manager Version 1.0
- 4** Starting the IBM LAN Manager
- 5** Setting up the system definition of the IBM LAN Manager.

Before you read this chapter, you must have installed and tested the appropriate adapter in the LAN Manager workstation. See "Network Hardware" on page 1-3 for a list of adapters. Refer to the adapter's guide to operations, or to the installation instructions packaged with the adapter.

Making Backup Copies of Your Files

To avoid damaging the original LAN Manager diskettes, use the DISKCOPY command to copy them to backup diskettes. Refer to the user's manuals for OS/2 or DOS if you are not familiar with DISKCOPY.

Use the copies during installation and when you need to erase the password. Make the copies now before continuing.

After you begin running the LAN Manager, you may also choose to make backup copies periodically of the following files:

DFIADEFS.DAT	Adapter definition file, if any
DFIEVENT.LOG	Event log file
DFIALDET.LOG	Alert detail file
DFISYS.DAT	System parameters file
DFIBDEFS.DAT	Bridge definition file, if any

Use the COPY command to make backup copies of individual files. Refer to the user's manual for OS/2 if you are not familiar with COPY.

Preparing Your System for the Installation

1 If you have made backup copies of the LAN Manager diskettes, you are now ready to prepare OS/2 and the fixed disk for installation. If not, read "Making Backup Copies of Your Files" on page 4-2.

2 If you are migrating from the IBM LAN Manager Version 1.0, you should make backup copies of the following files:

DFISNAME.DAT	Symbolic names file
DFIBRIDG.DAT	Bridge definition file
DFISYSTEM.DAT	System file
DFIALERT.DAT ¹	Alert log file
DFIEVENT.LOG ¹	Event log file

3 If you are migrating from the IBM Token-Ring Network Manager Version 1.0 or 1.1, make backup copies of the following files:

DFISNAME.DAT	Symbolic names file (version 1.1)
DFISYMMN.DAT	Symbolic names file (version 1.0)

4 Make sure that you have enough unused storage space on the fixed disk. (Use the CHKDSK command.)

You will need about 2.6 MB of disk space to install the IBM LAN Manager Version 2.0. Once the LAN Manager is running, it may need up to 4 MB of disk space should the log files, such as the event log, become full. In addition, for each bridge that the LAN Manager will log performance counters, an additional 145 KB of disk space is needed.

Note: The program files for the IBM LAN Manager, Version 2.0 will be copied over any Version 1.0 files.

¹ These files are used only with version 1.0, not with version 2.0. You need to back up these files only if you want to keep historical records of operations with version 1.0

5 Make sure you have loaded OS/2 EE Version 1.1.

6 If host communications is desired, make sure you have done the following to configure the Communications Manager to access the NetView host:

- a. Configure the SNA Feature Profile to use the SNA APPC interface. You will need to define the means of communications (SDLC, IBM Token-Ring Network, IBM PC Network).
- b. If the SNA Feature Profile was defined to communicate via the LAN (IBM Token-Ring Network, IBM PC Network), configure the LAN Feature Profile for LAN communications.

In addition to configuring the LAN Feature Profile you need to activate the Physical Unit (PU). To do this, use the Communication Manager to:

- 1) Create a locally-defined Logical Unit (LU) for the PU.
- 2) Configure the SNA Feature Profile to activate the LU automatically:
 - a) Go to the Initial Session Limit Profile in the SNA Feature Profile
 - b) Set "Number of Automatically Activated Sessions" to nonzero.

The locally-defined LU is needed to activate the PU but is not used by the LAN Manager application.

Notes:

- a. If the LAN Manager is to communicate with the host through NetView/PC via the LAN, set the following **LAN Feature Profile** parameters to the following minimum values:

Maximum number of SAPS:	5
Maximum number of Users:	5

- b. Refer to "Configuring SNA Feature Profiles" in *The OS/2 Extended Edition Version 1.1 System Administrator's Guide for Communications* for more information.

7 Add the \LANMGR directory to the LIBPATH statement in your CONFIG.SYS file. (See the *OS/2 Extended Edition Version 1.1 User's Guide*.)

8 Press **Ctrl-Alt-Del** to restart your computer. This will activate any changes you made to your CONFIG.SYS file.

You should keep the following considerations in mind:

Notes:

1. The OS/2 installation program automatically adds the following line to your CONFIG.SYS file:

```
THREADS=255
```

The LAN Manager itself uses 10 threads. Refer to the *OS/2 Extended Edition Version 1.1 User's Guide*, for more information about threads.

2. The LAN Manager uses one DLC link station for each bridge to which the LAN Manager will link, up to a maximum of 64. Refer to the *OS/2 Extended Edition Version 1.1 User's Guide* for information on configuring the LAN Profile.

Each adapter has limitations on how many DLC link stations it can support. The default, when the LAN Profile is configured, is 8 DLC link stations.

3. At initialization, the LAN Manager will request the maximum number of DLC link stations available, or 64, whichever is the lesser. If you plan to run other network applications that use one or more DLC link stations, you may need to start those first.

Installing the LAN Manager Version 2.0

Before you begin

You should already have performed the steps in "Preparing Your System for the Installation" on page 4-3. If you have previously installed the IBM LAN Manager, Version 1.0 or the IBM Token-Ring Network Manager, Version 1.0 or 1.1, then files for these programs will be erased as you install the IBM LAN Manager, Version 2.0, except those files that will migrate.

Follow these steps to install the LAN Manager on a fixed disk.

- 1 At the OS/2 command prompt, type:

d:

and press **Enter**, where *d* is the disk drive on which OS/2 has been installed.

- 2 Type:

CD \OS2\INSTALL

and press **Enter**.

- 3 Insert the *IBM LAN Manager Diskette 1* into drive A.

- 4 Use the OS/2 EE Installation Facility called "INSTAID" to install the LAN Manager. Type:

INSTAID

and press **Enter**.

If OS/2 prompts you that not enough memory is available, remove another application to increase available memory, or install additional memory and try again.

- 5 Follow the instructions given on your display for the installation procedure.

- 6** The LAN Manager installation procedure is now complete. Remove the LAN Manager diskettes and store them in a safe place. **Do not copy anything else to the LANMGR directory.** Files copied to this directory will be lost if the LAN Manager is reinstalled.

You can now perform migration or start the IBM LAN Manager Version 2.0. Read the following table for where to go next.

To do this...	Go to:
Migrate files from the IBM LAN Manager, Version 1.0	"Migration from LAN Manager Version 1.0" on page 4-8
Migrate files from the IBM Token-Ring Network Manager, Version 1.0 or 1.1	"Migration from IBM Token-Ring Network Manager Version 1.0 or 1.1" on page 4-11
Start the IBM LAN Manager Version 2.0	"Starting the LAN Manager" on page 4-13

Migration from LAN Manager Version 1.0

Before you begin

Read this section only if:

- You have already installed the IBM LAN Manager Version 2.0, **and**
- You want to migrate files from the LAN Manager Version 1.0 to Version 2.0.

Otherwise, see the installation sequence overview on 4-1.

LAN Manager Version 1.0 and Version 2.0 Files

The format of LAN Manager Version 2.0 files is different from Version 1.0 files. The LAN Manager Version 2.0 *Diskette 1* installs a utility program called MIGRATE that will convert files from Version 1.0 to Version 2.0. Table 4-1 shows a list of Version 1.0 files and the files that are created by running the MIGRATE utility.

Table 4-1. Migration of Files from LAN Manager Version 1.0 to Version 2.0

Description	Version 1.0	Version 2.0
Symbolic names file ¹	DFINAMES.DAT	DFIADEFS.DAT
Bridge definition file	DFIBRIDG.DAT	DFIBDEFS.DAT
System file ²	DFISYSTEM.DAT	DFISYS.DAT

Notes:

1. If you were running LAN Manager Version 1.0 on an IBM PC Network station, migrating the symbolic names file preserves the list of monitored adapter addresses.
2. The LAN Manager adapter number, reporting link number, reporting link password, trace option and the LAN name are preserved when you migrate the system file.

Migrating Files from Version 1.0 to Version 2.0

The following procedure explains how to migrate files from the IBM LAN Manager Version 1.0 to the IBM LAN Manager Version 2.0.

Warning: Do this procedure *after* you have installed Version 2.0. and *before* adding any adapter definitions or bridge definitions or changing the system definition using LAN Manager Version 2.0.

Depending on the file being converted, MIGRATE erases any existing DFIADEFS.DAT file, DFIBDEFS.DAT file, or DFISYS.DAT file, and you will lose the data you added or changed.

1 If your working version of LAN Manager Version 1.0 was not installed on this fixed disk or was installed as a NetView/PC application, copy to the LANMGR directory on this fixed disk the old file or files you want to convert:

- Symbolic names file (DFINAMES.DAT)
- Bridge definition file (DFIBRIDG.DAT)
- System file (DFISYSTEM.DAT).

Otherwise, proceed to step 2.

2 At the OS/2 command prompt, type:

CD \LANMGR

and press **Enter**.

3 Type the appropriate command, depending on which file or files you want to migrate.

To migrate...	Type this command.
Symbolic names file	MIGRATE LANMGR NAMES
Bridge definition file	MIGRATE LANMGR BRIDGES
System file	MIGRATE LANMGR SYSTEM
All three files	MIGRATE LANMGR ALL

- 4 Follow the instructions for the migration procedure given on your display.
- 5 Repeat the MIGRATE program for each file you wish to convert.
- 6 When the migration utility has finished, the new Version 2.0 files will be present in the LANMGR directory. You can now start the LAN Manager. Go to "Starting the LAN Manager" on page 4-13.

Note: Your old Version 1.0 files will also remain in the LANMGR directory. Once you are satisfied that the IBM LAN Manager Version 2.0 is installed and running properly, you can erase the Version 1.0 files. See Table 4-1 on page 4-8 for the file names used by each version.

Migration from IBM Token-Ring Network Manager Version 1.0 or 1.1

Before you begin

Read this section only if:

- You have already installed the IBM LAN Manager Version 2.0, *and*
- You want to migrate the symbolic names file to the LAN Manager Version 2.0.

Otherwise, see the installation sequence overview on Chapter 4, "Installing the LAN Manager" on page 4-1.

IBM Token-Ring Network Manager Files

The LAN Manager cannot use IBM Token-Ring Network Manager Version 1.0 and 1.1 files. The information in those files can be viewed and printed only by the respective Network Manager version. The symbolic names file, however, can be converted to a form the LAN Manager Version 2.0 can use (see "Migrating the Symbolic Names File" on page 4-12).

Installing the LAN Manager does not affect the IBM Token-Ring Network Manager files. You should do the following if you have not already done so:

- Make backup copies of the following files, found in the \RINGMGR directory:

Symbolic names file	DFISYMNM.DAT or DFISNAME.DAT
Event log file	DFIEVENT.LOG
Alert detail file	DFIALDET.DAT
- Erase all the files in the \RINGMGR directory and remove the directory from the fixed disk. This will give you more free space on your fixed disk, since these files are no longer needed once you have installed the IBM LAN Manager.

Migrating the Symbolic Names File

Before you begin

You should do this migration procedure *before* adding any adapter names using LAN Manager Version 2.0. Migration erases any existing DFIADEFS.DAT file, and you would therefore lose any names you had added.

1 Copy the Version 1.1 symbolic names file (DFISNAME.DAT) or the Version 1.0 symbolic names file (DFISYMN.M.DAT) to the \LANMGR directory.

2 At the OS/2 command prompt, type:

CD \LANMGR

and press **Enter**.

3 Type:

MIGRATE NETMGR

and press **Enter**.

4 Follow the instructions for the migration procedure given on the screen.

The migration creates a new symbolic names file that can be used by the IBM LAN Manager Version 2.0. This file is named DFIADEFS.DAT.

You can now start the IBM LAN manager. Go to "Starting the LAN Manager" on page 4-13.

Starting the LAN Manager

The LAN Manager is designed to be started and left running continuously. To start the LAN Manager after installing it, follow the instructions below.

Before you begin

- Make sure the date and time are correct in your computer. The LAN Manager uses the date and time in your computer as the date and time stamp for network events that are logged.
- Make sure the default drive is set to the fixed disk.
- Make sure that the program used to communicate with a host has been started, if host communication is desired (OS/2 Communication Manager or NetView/PC).

- 1 Select **IBM LAN Manager 2.0** from the OS/2 **Program Selector** panel.
- 2 At the IBM LAN Manager copyright panel, press **Enter**.
You may need to wait a few seconds for the **LAN Manager Functions** panel to appear.
 - If OS/2 tells you that you do not have enough memory, remove another application to release some memory or install additional memory in your computer.
- 3 If you are starting the LAN Manager for the first time after installing it, go to "Customizing the LAN Manager" on page 4-14 to prepare your system for operation. Otherwise, you can begin using the LAN Manager.

Starting the LAN Manager Automatically

The LAN Manager will be loaded automatically when you turn on your computer, if you enter the following line in the OS/2 STARTUP.CMD file:

```
d: \LANMGR\LANMGR
```

where *d*: is the drive name.

Execute the STARTUP.CMD file by powering on the computer or by pressing **Ctrl-Alt-Del**. Refer to the *OS/2 EE User's Guide* for information about the STARTUP.CMD file.

Customizing the LAN Manager

When you start the LAN Manager for the first time after installing it, you need to define certain aspects of your network to the system to prepare the LAN Manager for operation. Even if you upgraded from the IBM Token-Ring Network Manager or a previous version of the LAN Manager, you need to perform this initial system preparation.



The network administrator should first fill out the worksheets in Appendix D, Worksheets. These completed worksheets will make customizing the IBM LAN Manager quicker and easier. Retain the worksheets in a safe place for future reference.

You should perform the following tasks before you run the LAN Manager Version 2.0 for the first time:

- 1 For each adapter to be managed by the LAN Manager, you can add an adapter definition.

Select **Adapter Definition** from the **Adapter Functions**. Enter the required information from the "Adapter Definition Worksheet" on page D-5.

- 2 For each bridge to which the LAN Manager will link, add a bridge definition.

Select **Bridge Definition** from the **Bridge Functions**. Enter the required information from the "Bridge Definition Worksheet" on page D-7.

- 3 Select the adapter number to be used by the LAN Manager.
Select **Adapter Number** from the **System Definition** panel. Enter the selection from the "System Definition Worksheet" on page D-3.
- 4 Specify the name of the local area network to be managed by the LAN Manager.
Select **LAN Name** from the **System Definition** panel. Enter the LAN name from the "System Definition Worksheet" on page D-3.
- 5 Specify an operator password to restrict operator access to the LAN Manager.
Select **Security** from the **System Definition** panel. Enter the password defined by the network administrator.
- 6 Specify frame tracing authorization to limit frame tracing on the network.
Select **Trace Option** from the **System Definition** panel. Enter the trace option information as defined on the "System Definition Worksheet" on page D-3.
- 7 Specify configuration logging options to log network configuration changes.
Select **Configuration Logging** from the **Event Log Functions** panel.
- 8 Specify the reporting link number and reporting link password to be used when linking to bridges.
Select **Reporting Link** from the **System Definition** panel. Enter the reporting link number and the reporting link password, as defined in the "System Definition Worksheet" on page D-3.

9 Specify the type of host connection.

Select **Host Connection** from the **System Definition** panel. Enter the selection from the "System Definition Worksheet" on page D-3. Enter the Service Point name from the worksheet also.

10 Specify the background color for LAN Manager panels.

The colors used in LAN Manager are defined in a file called DFI.PRO. There are four option files which you can use to change the background color:

DFIBLACK.PRO	black background (<i>default</i>)
DFIWHITE.PRO	white background
DFIBLUE.PRO	blue background
DFICYAN.PRO	cyan background

To change the background color, copy the appropriate file to the file DFI.PRO. These files are all located in the \LANMGR directory on the fixed disk.

If you do nothing, the background color will be black.

Reinstalling the LAN Manager

If for any reason it becomes necessary to reinstall the LAN Manager, you should:

- 1 Back up the following files:

DFIADEFS.DAT	Adapter definition file
DFIEVENT.LOG	Event log file
DFIALDET.LOG	Alert detail file
DFISYS.DAT	System parameters file
DFIBDEFS.DAT	Bridge definition file, if any

- 2 Install the LAN Manager again. (See Chapter 4, "Installing the LAN Manager" on page 4-1.)

- 3 Restore the files you backed up. However, do **not** restore any file that contributed to a LAN Manager problem. The file will be named in the error message in most cases.

LAN Manager Functions

Chapter 5. Introduction to LAN Manager Functions

Keep the LAN Manager reference card handy for easy reference when performing LAN Manager tasks.

Select **IBM LAN Manager 2.0** from the OS/2 **Program Selector** panel to perform all IBM LAN Manager functions.

You may need to wait for several seconds at the **Initialization** panel before you can continue. You do not need to do anything on this panel. If you have set an operator password, you must enter the password before the **LAN Manager Functions** panel will appear. If you have not set a password, the **LAN Manager Functions** panel is displayed.

Figure 5-1 on page 5-2 shows the various functions that are available, starting from the LAN Manager Functions panel.

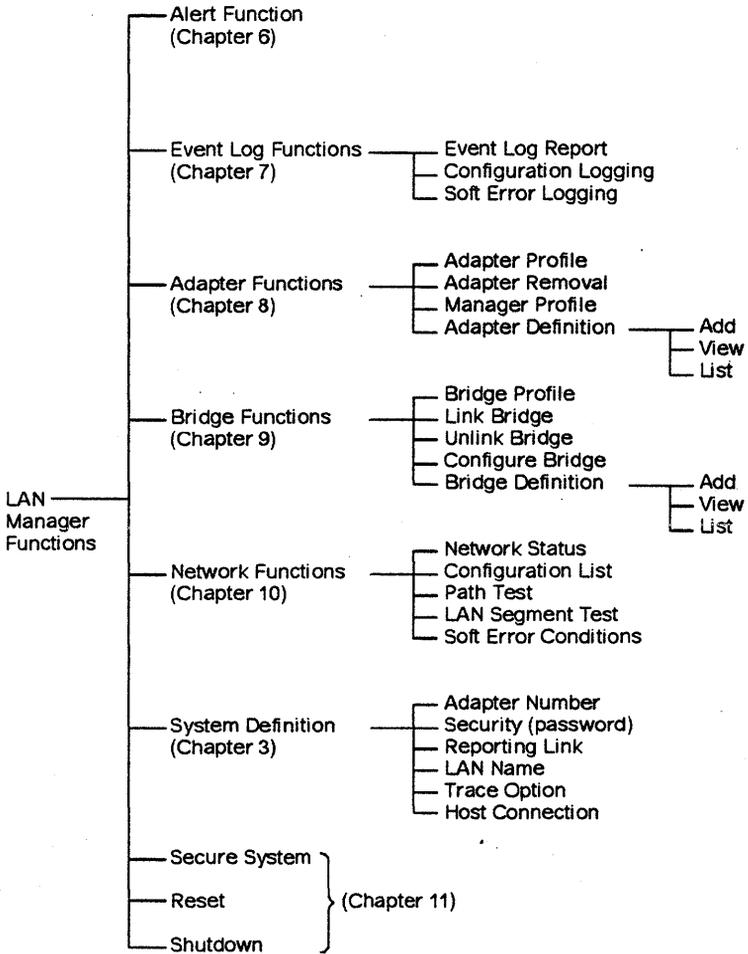


Figure 5-1. LAN Manager Functions

LAN Manager Functions

Table 5-1 (Page 1 of 2). LAN Manager Functions		
Function	Task	Page
Alert Functions	Display information about alerts received, or delete alerts from the alerts file.	6-4
Event Log Functions	Display or print reports from the event log or delete the event log.	7-1
	Specify whether to log configuration changes in the event log.	7-4
	Specify the kind of soft errors to be reported.	7-5
Adapter Functions	Request information about adapters.	8-2
	Remove an adapter from the network.	8-8
	Request information about the LAN Manager's adapter.	8-9
	Specify which adapters should cause alerts if removed from the network.	8-19
	Add/find/change/display/print symbolic names.	8-12
Bridge Functions	Display a bridge's parameters and performance counters.	9-3
	Establish a reporting link with a bridge.	9-9
	Terminate a reporting link with a bridge.	9-10
	Set bridge parameters.	9-10
	Add/find/change/delete/display bridge definitions.	9-17
Network Functions	Display the status of the network.	10-2
	Display or print order of active adapters on a LAN segment.	10-6
	Conduct a path test.	10-9
	Conduct a LAN segment test.	10-10
	Display or remove adapters experiencing soft errors.	10-11

Table 5-1 (Page 2 of 2). LAN Manager Functions

Function	Task	Page
System Definition	Check or change the adapter number.	3-3
	Establish or change the operator password.	3-5
	Reset the operator password.	11-2
	Define the authorization level and reporting link password the LAN Manager will use.	3-6
	Define the LAN name to use in alerts.	3-9
	Specify whether to allow trace tool.	3-9
	Define how the LAN Manager communicates with a host.	3-10
Secure System	Protect the LAN Manager from unauthorized use.	11-1
Reset	End the LAN Manager and start it again.	11-2
Shutdown	End LAN management functions and return to OS/2.	11-2

Chapter 6. Alert Function

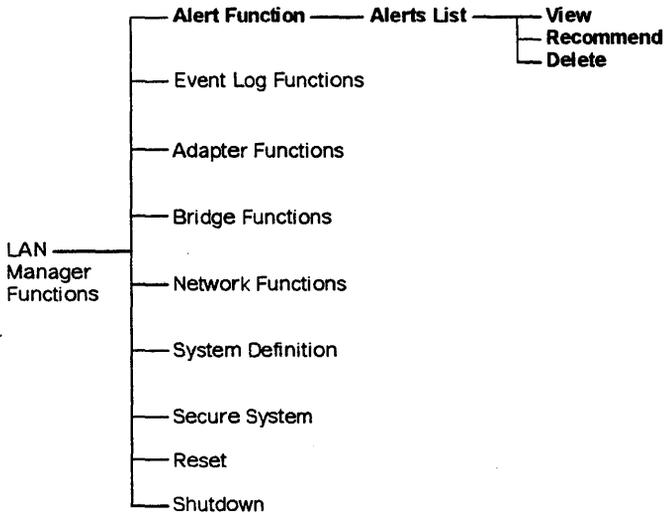
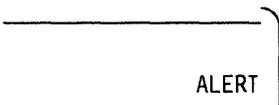


Figure 6-1. Alert Function

An *alert* is a notification of a security violation on the network or of an interruption or a potential interruption in the flow of data around the network. A beep, accompanied by either of two messages, indicates that the network has an alert condition:

If you are operating the LAN Manager, the word “ALERT” is displayed in the top right corner of all LAN Manager panels.



The word “ALERT” will continue to be displayed until you view or refresh the **Alerts List** panel using **Alert Function**.

Additionally, if you are operating with NetView/PC, the letters "LM" are displayed in the bottom right corner of all LAN Manager and NetView/PC panels. This indicates that an alert has been logged in the LAN Manager alert log.



An alert can appear while you are viewing any LAN Manager panel. However, you must select **Alert Function** from the **LAN Manager Functions** panel to discover the cause of the alert:

- Display the list of alerts
- Check details for an alert
- Display the failing resources for an alert
- Check recommended actions for an alert
- Delete an alert from the list.

Use **PgUp**, **PgDn**, **Home**, and **End** to scroll the **Alerts List**, **Alert Details**, and **Recommended Actions** panels.

Recording of Alerts

As each network alert occurs, it is recorded in the alerts file and in the event log of each LAN Manager in the network. An alert related to a specific LAN Manager, its adapter, or its bridge link failures is recorded in the alerts file and the event log of that LAN Manager only.

The alerts file holds 250 alerts and then begins to overwrite existing alerts. You can delete a single alert, or all alerts, to make more room in the alert file.

Alerts List

```

RFSPAM10          IBM LAN MANAGER          Items 1 to 4 of 4
Normal           Alerts List

Type an action letter next to an alert, then press Enter.
Alerts transferred to the host are marked with an asterisk (*)

  A      B      C      D      E      F      G
  Action Name  Type  Date  Time Type  Alert Description
-----
-   * RING002 RING 11/12 01:17 Perm  Token-Ring Inoperative
-   BRD02   BRDG 11/12 01:12 Perm  Mngmt server reporting link error
-   ACCOUNTG LAN 11/10 07:45 Perm  Resource unavailable
-   * CBUS001 CBUS 11/10 06:30 Perm  CSMA/CD Bus Inoperative
-
-
-
-
-
-

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh F9=Delete File  Home PgUp
                                End PgDn
  
```

Figure 6-2. Alerts List Panel. Asterisks (*) indicate alerts sent to a host.

A Action letter:

- V View-details
- R Recommend
- D Delete

B Resource Name. The name of the source of the alert. For a network type of alert, the resource name will be CBUSxxxx or RINGxxxx. For a bridge alert, the resource name is the bridge name (defined in **Bridge Definition**). An asterisk (*) beside the resource name indicates the alert has been sent to a host.

C The Resource Types are:

RING	Token-Ring Network LAN segment
BRDG	Bridge
LAN	Local Area Network
CBUS	PC Network LAN segment (CSMA/CD bus)
APPL	Application Program Name
SP	Service Point

D The date displayed is the date the alert occurred.

E The time displayed is the time the alert occurred.

F The error type indicates the severity of the alert. The alerts are listed in Table 6-1 on page 6-6.

PERM	The adapter that is the source of the problem will not recover from the permanent error by itself.
TEMP	The user of the adapter that is the source of the problem will notice that an error has occurred, but the adapter will recover from the temporary error by itself.
PERF	The performance of the adapter that is the source of the problem has been degraded. It is responding more slowly than the established normal response time.
IMPN	The LAN Manager is notifying you that the adapter that is the source of the problem may encounter a critical error soon.
UNKN	The LAN Manager does not know how severe the alert is.

G The descriptive information includes a short description of the alert. Table 6-1 on page 6-6 indicates the LAN Manager error message that corresponds to the short description of the alert. If you received an alert, you can find additional information about each alert and error message by looking up the corresponding message in the LAN Manager event log. Messages are also documented briefly in Appendix A, LAN Manager Messages.

Table 6-1 (Page 1 of 2). LAN Manager Alert Messages		
Short Description in Alert Log	Message No. in Event Log	Error Message in Event Log
Excessive token-ring errors	DFIPD101	Ring error limit exceeded
Communication overrun	DFIPD107	Adapter congested
Software program error	DFIPD120	Error reporter failed, processing continues
Monitored station left LAN	DFIPD123	Monitored adapter is not on network
Management Server Reporting Link error	DFIPD180	Bridge link failure
Invalid reporting link password	DFIPD183	LAN Manager rejected by bridge
Error to traffic ratio exceeded	DFIPD187	Bridge performance threshold exceeded
LAN management data lost	DFIPD188	Bridge congested
Token-ring inoperative	DFIPD202	Error occurred: ring recovery failed
Token-ring temporary error	DFIPD203	Error occurred: ring recovered
Auto removal.	DFIPD204	Error occurred: ring recovered, adapter(s) removed
Auto removal	DFIPD209	Auto-removal error
Adapter error	DFIPD212	LAN Manager's adapter hardware failed
Software program error	DFIPD213	LAN Manager's adapter interface failed
Wire fault	DFIPD215	LAN Manager's adapter or lobe failed
Remove-adapter command received	DFIPD222	Adapter removed
LAN bridge taken offline	DFIPD306	Bridge shut down

Table 6-1 (Page 2 of 2). LAN Manager Alert Messages		
Short Description in Alert Log	Message No. in Event Log	Error Message in Event Log
Unauthorized LAN insertion attempted	DFIPD323 W	Unauthorized trace attempt on the LAN
Primary path wrapped to backup path	DFIPD326 E	Main token-ring wrapped to backup ring
Secondary token-ring inoperative	DFIPD327 E	Secondary token-ring inoperative
CSMA/CD bus inoperative	DFIPD352 E	Network recovery failed — continuous carrier
Auto removal	DFIPD354 E	Network recovered — adapter removed
CSMA/CD bus inoperative	DFIPD355 E	Continuous carrier — source unknown
CSMA/CD LAN communications lost	DFIPD356 E	Network inoperative — no carrier detected
Software program error	DFIPD990 E	System abend

Resource				Error
Name	Type	Date	Time	Type
-----	----	----	----	----
BRDG02	BRDG	11/12	01:12	Perm
		Address		Name
D	Local Station :	100005A00AB	PS2R00M226	
E	Remote Station. . . . :	100005A00AC	PS2R00M227	
F	Single Station. . . . :			
G	Fault Domain			Weight
	Upstream. :			
	Downstream. :			
H	LAN Segment :		Bridge ID . . . : 20020030	Beacon Type. . . :
I	Routing Info. :	062000122002003000000000000000000000		
J	Local Device Address. . . . :	01		Remote Device Address . . . : 02

Esc=Cancel F1=Help F3=Exit F4=Recommend F9=Delete Home PgUp

Figure 6-4. Alert Details - Link Detailed Data Panel

- D** Local Station. The address and symbolic name of the LAN Manager, if it is the failing resource.
- E** Remote Station. The address and symbolic name of the failing remote resource.
- F** Single Station. The address and symbolic name of the failing station.
- G** Fault Domain. The addresses and symbolic names of the two adapters that make up the fault domain of the failing resource. The upstream adapter is the NAUN of the downstream adapter. If this is a soft error alert, the downstream adapter is the reporting adapter. The weight is the error count for each adapter.

H The three following fields:

LAN Segment	LAN segment to which the failing resource was attached.
Bridge ID	Routing information that identifies the bridge (LAN segment number-bridge number-LAN segment number) if a bridge is the failing resource.
Beacon Type	Type Codes: 01 Set recovery mode 02 Signal loss 03 Streaming signal 04 Streaming signal, Claim Token MAC frame.

I Routing Info. The routing between the LAN Manager and the bridge, if a bridge is the failing resource. If the bridge is attached to the LAN Manager's LAN segment, then all zeros are displayed. Note that the routing information displayed includes the route control field (first 4 characters) followed by the route (32 characters).

J Local Device Address/Remote Device Address. The link station DLC source service access point (SSAP) of the failing link or the link station DLC destination service access point (DSAP) of the failing link.

Recommended Actions

The **Recommended Actions** panel suggests additional possible causes and actions you should take. It displays the following information:

```
DFIPAM38                      IBM LAN MANAGER                      Page xx of yy
Normal                         Recommended Actions

Resource
Name   Type   Date   Time   Error
-----
BRDG02                11/12   01:12   Perm

A Failure cause. : LAN communication error
                        Software error
B Actions. . . . : Review Link Configuration Display
                        If problem persists then do the following
                        Contact LAN Administrator responsible for this LAN

C User cause . . . : None
D Actions. . . . : None

E Install cause. : None
F Actions. . . . : None

Esc=Cancel F1=Help F3=Exit F4=Details F9=Delete           Home PgUp
                                                           End   PgDn
```

Figure 6-5. Recommended Actions Panel

- A** Failure cause. An indication (more specific than “probable cause”) of the component that failed, in a list of up to 10 failure causes from the most probable to the least.
- B** Actions. The recommended actions you should take in response to the alert, listed in the order they should be performed.
- C** User Cause. A list of up to 10 possible user actions that may have caused the alert.
- D** User Action. A list of up to 10 recommended actions to correct the problem, listed in the order that they should be performed.

- E** Install Cause. A list of up to 10 possible installation errors that may have caused the alert.
- F** Install Action. A list of up to 10 recommended actions to correct the problem, listed in the order that they should be performed.

When you no longer need the alert information to be maintained in the alerts file, you may delete the alert. Alerts may be deleted from the **Alert Function**, **Alert Details**, and **Recommended Actions** panels.

You should refresh the current panel if you receive an alert notification on your screen while you are viewing either the **Alerts List**, the **Alert Details**, or the **Recommended Actions** panels.

Chapter 7. Event Log Functions

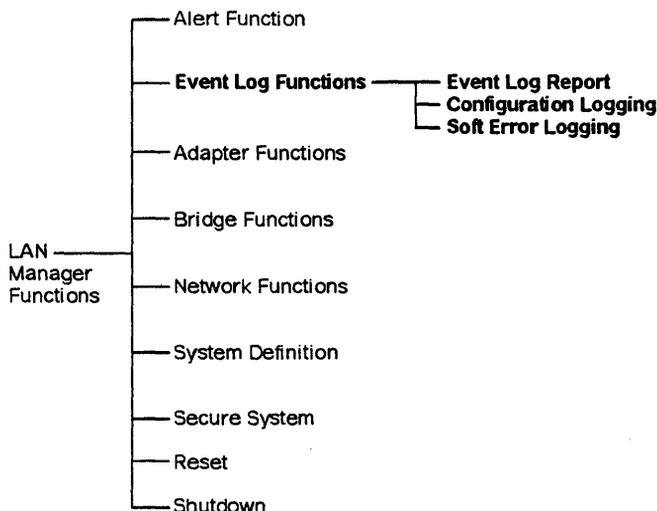


Figure 7-1. Event Log Functions

You may use **Event Log Functions** to do the following:

- View event log reports by selected parameters
- Set the options to log configuration changes in the event log
- Set the options to log soft error reports in the event log.

The event log contains the following information about activity on the network:

- Changes in the configuration of the network
- Alerts
- Invalid data frames received by the LAN Manager
- Change in the status of the adapter that is running the LAN Manager
- Soft error reporter notifications (Token-Ring Network only)
- Soft errors (Token-Ring Network only).

The event log includes all alerts except System Abend (DFIPD990). It includes notifications of configuration changes (adapters entering or leaving the network) if you set the logging option to do so in "Configuration Logging" on page 7-4.

The event log is stored on the fixed disk with the filename DFIEVENT.LOG. When the event log fills up it "wraps around," and the newest events are written over the oldest. The event log fills up and wraps around more quickly when configuration change notifications and additional soft error reports are included.

Event Log Report

Use **Event Log Report** to do the following:

- Determine where errors are occurring most frequently
- Examine soft error reports
- Create a report of the event log
- Inspect information about configuration changes
- Inspect information about bridge changes
- Delete the entire event log
- Query or remove an adapter
- Create a printable file
- Recreate history.

You can request event log reports for specific information:

- Date range
- Time range
- Segment of time within a date range
- Adapter name or hexadecimal address
- Bridge name
- LAN segment
- Message number.

You may specify any combination of these values by filling in the fields on the **Request Event Log Report** panel.

```

DFI PRP10                               IBM LAN MANAGER                               hh:mm:ss mm-dd-yy
Normal                                  Request Event Log Report

To view the entire event log, leave all fields blank and press Enter.
For selected entries, type your choice and press Enter.
To delete the ENTIRE event log, press F9 (Delete).

Retrieve messages by these categories:

Logged from this start date . . . . . [mm-dd-yy]
to the end date . . . . . [mm-dd-yy]

Logged from this start time . . . . . [hh:mm:ss]
to this end time . . . . . [hh:mm:ss]

For this adapter address/name . . . . [          ]
With this message number . . . . . [  ]
For this LAN segment . . . . . [  ]

For this bridge name . . . . . [          ]

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh F9=Delete

```

Figure 7-2. Request Event Log Report

If you do not fill in these fields, the LAN Manager will display every entry in the event log.

Note: If the date and time were incorrect when you started the LAN Manager, some entries in the event log will be filed with the wrong date and time stamps.

The event log reports are displayed on the screen in the form of a list of messages logged in the event log. Move the cursor to any message in the list and press **Enter** to see details about the message.

If you choose to print the event log report, the LAN Manager creates a printable file called REPTFILE.PRT. You may then print this file using the PRINT command in OS/2. You may also edit the file using an ASCII text editor.

Configuration Logging

Choose **Configuration Logging** to indicate that you want the event log:

- To contain notification of changes in the configuration of the network for a single LAN segment or for all LAN segments
- To omit configuration changes.

The configuration of the network changes constantly as adapters attach to and remove themselves from the LAN segments.

By selecting "None," "All," or a LAN segment number, on the **Change Configuration Logging** panel, you choose whether you want changes in the configuration of the network or of a single LAN segment to be recorded in the event log.

If the setting is "None" on the **Change Configuration Logging** panel, changes will not be recorded in the event log. This is the setting every time the LAN Manager is initialized or reset.

If the setting is "All" or a LAN segment number, changes are recorded in the event log. You can see the changes by displaying or printing an event log report.



On a token-ring LAN segment, configuration changes are logged when NAUN (Next Active Upstream Neighbor) changes occur on the network. The NAUN of any adapter is the adapter that immediately precedes that adapter in the token-ring data path. A NAUN change occurs when the current upstream adapter leaves the network, or when a new upstream adapter joins the network.

If the LAN Manager is linked to a bridge connected to the LAN segment being logged, adapter insertions are reported.



On a PC Network, changes are logged when an adapter joins or leaves the network.

Soft Error Logging



Soft error logging applies only to Token-Ring LAN segments.

A *soft error* is an error on the network that temporarily degrades the token-ring LAN segment's performance. It causes the data to be transmitted on the token-ring LAN segment more than once to be received correctly. A token-ring LAN segment can automatically recover from a soft error.

Use **Soft Error Logging** to change the level of detail of the information that is logged about soft errors on a token-ring LAN segment.

Note: Only a controlling LAN Manager in a network can change the soft error logging option for a remote Token-Ring LAN segment.

Regardless of the level of logging you specify, an alert is generated when the LAN segment is experiencing an unacceptable number of soft errors. If you specify "Full" or "Limited" soft error logging for a token-ring LAN segment, the LAN Manager logs the individual soft error reports that caused the alert. From these reports, you can tell what kind of soft errors the LAN segment is experiencing, and what adapters are generating them.

Normally, it is not necessary to know what kind of soft errors are occurring. For problem determination, you need only the information that accompanies the alert, not the detailed information from the individual reports.

You can choose among four options for each Token-Ring Network segment, as shown in Table 7-1 on page 7-6.

Table 7-1 (Page 1 of 2). Soft Error Logging Options

Option	Description
<p>Full soft error logging</p>	<p>All soft error reports from all adapters on the Token-Ring Network segment are logged. This option can be used for only one Token-Ring LAN segment in the network at a time. The following messages are logged only when this option is selected.</p> <p>DFIPD102 W Ring errors increasing DFIPD103 I Ring errors decreasing DFIPD104 I Recovered error counters DFIPD106 I Ring error report DFIPD108 W Ring poll failure DFIPD109 W Ring monitor error - ring recovered DFIPD190 W Invalid message length DFIPD191 W Duplicate data in message DFIPD192 W Missing data in message DFIPD224 I New ring monitor</p> <p>Use this option only when you need to know what kinds of soft errors are being experienced on the entire Token-Ring LAN segment.</p> <p>Note: Only one LAN segment can be set to "Full" at a time.</p>
<p>Limited soft error logging</p>	<p>Only those soft error reports from any adapter(s) accumulating excessive soft errors level are logged. The LAN Manager also logs soft error reports from the upstream and downstream adapters of the adapter(s) with excessive soft errors.</p> <p>The following messages are logged in addition to soft error alerts:</p> <p>DFIPD102 W Ring errors increasing DFIPD103 I Ring errors decreasing</p> <p>Use this option only when you need to know what kinds of soft errors are being experienced by adapters in areas of the token-ring LAN segment where large numbers of soft errors are occurring.</p>
<p>No soft error logging (default)</p>	<p>No individual soft error reports are logged.</p> <p>This is the recommended setting for soft error logging. This option allows you to receive alerts necessary for most troubleshooting, without logging all the soft error reports that caused the alerts.</p>

Table 7-1 (Page 2 of 2). Soft Error Logging Options	
Option	Description
Reset soft error logging	<p>The internal counters for soft error reporting are returned to 0. This option updates the error logging mode to "No soft error logging."</p> <p>Reset soft error logging if you want to erase the counters for soft errors that have occurred up to now. Choose "Reset soft error logging" if you have received the alert "LAN Manager error reporter failed."</p>

Chapter 8. Adapter Functions

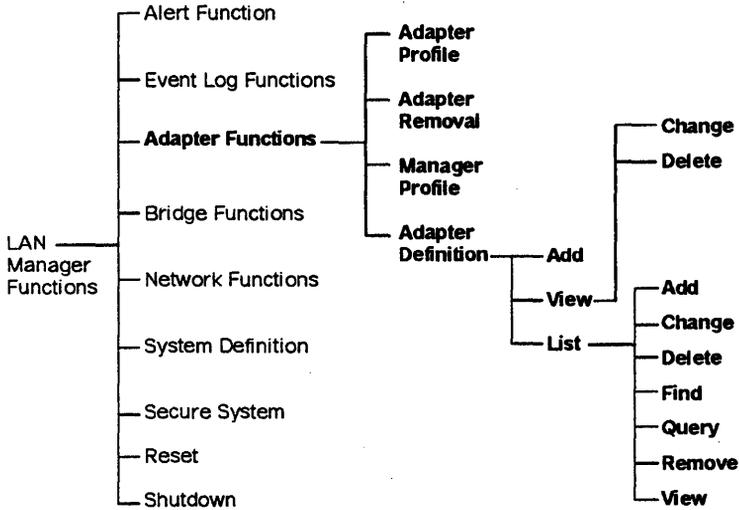


Figure 8-1. Adapter Functions

Choose **Adapter Functions** to do any of the following:

- Display information about any adapter
- Remove an adapter from a LAN segment
- Assign a name to an adapter
- Specify which adapters should cause alerts if removed from the network
- Check for duplicate adapter addresses.

This chapter describes each function and suggests when to use it.

Adapter Profile

This function gives you the following information about any adapter that is active on the network. (Use the **Manager Profile** function if you need information about the LAN Manager's adapter. See "Manager Profile" on page 8-9.)

```
DFIPAP20                      IBM LAN MANAGER                Page 1 of 1
Normal                          Adapter Profile

A Adapter address/name . . . . . : 400000000A1/ADAPT01
B LAN segment number . . . . . : 001
C LAN segment type . . . . . : Token-Ring 16 Mbps
D NAUN address/name . . . . . : 10005A100112/BR21AD1
E Microcode level . . . . . : 010000CAP0000
F Product ID . . . . . : 434F5246554656542000
G Adapter monitored? . . . . . : No
H Universal address . . . . . : 10005A082461
I Group address . . . . . : 00000000
J Functional addresses . . . . . : 0002008
                                   LAN Manager
                                   Ring Error Monitor

Esc=Cancel  F1=Help  F3=Exit

                                   End  PgDn
```

Figure 8-2. Adapter Profile Panel: Token-Ring Network

- A** Adapter address/name. The adapter's hexadecimal address and symbolic name.
- B** LAN segment number. The number the LAN Manager uses to indicate the LAN segment to which the adapter is attached.
- C** LAN segment type. The type can be either Token-Ring or PC Network.
- D** NAUN address/name. The adapter address and name of the NAUN (nearest active upstream neighbor).
- E** Microcode level. The version of microcode in the adapter.

F Product ID. The serial number and machine type, in hexadecimal, of the device that contains the adapter card, if available.

G Adapter monitored? If "Yes," the adapter is monitored. If "No," the adapter is not monitored.

Monitoring means the LAN Manager generates an alert whenever the adapter is not active on the network.

H Universal address. This is also known as the universally administered address. The universal address is permanently encoded in a read-only memory in the adapter at the time of manufacture. This field may be blank.

I Group address. This address represents the group of logically related adapters to which this adapter belongs. A program can send a single message to a group address, and have all adapters with that group address receive the message.

J Functional addresses. These indicate the adapter's function, such as Active Monitor. An adapter may have up to 31 functional addresses.

For more information about functional addresses, see the *IBM Token-Ring Network Architecture Reference* or the *IBM PC Network Adapter Technical Reference*. Possible function names and addresses are listed in Table 8-1 on page 8-4.

Table 8-1. Possible Adapter Functional Addresses

Functional Addresses	Function Name	
	Token-Ring Adapter	PC Network Adapter
X'00000001'	Active monitor	Not applicable
X'00000002'	Ring parameter server	LAN parameter server
X'00000008'	Ring error monitor	LAN error monitor
X'00000010'	Configuration report server	Not applicable
X'00000080'	NETBIOS	NETBIOS
X'00000100'	Bridge	MAC Bridge
X'00002000'	LAN Manager	LAN Manager
X'00008000' to X'40000000'	(User defined)	(User defined)


```
DFIPAP30                      IBM LAN MANAGER          Page 2 of 2
Normal                          Adapter Profile

Adapter address/name . . . . . : 400000000A1/LANMGR

CRC errors . . . . . : 0
Alignment errors . . . : 0      Resource errors . . : 0
Collisions . . . . . : 0      Packets sent . . . : 2
Aborted transmissions : 0      Packets received . : 2

Esc=Cancel  F1=Help  F3=Exit                                Home PgUp
```

Figure 8-4. Adapter Profile Panel: PC Network (2 of 2)

Notes:

1. The PC Network adapter error counters are reset every minute and each time the adapter is queried.
2. The location of the PC Network adapter (identified by LAN segment number) may need to be verified using the **Configuration List** function.

Duplicate Addresses: If you request an adapter profile by adapter address only, rather than by LAN segment number, and the LAN Manager finds duplicate adapter addresses:



On the IBM Token-Ring Network, the LAN Manager lists the LAN segments on which the adapter addresses were found. Select the desired LAN segment and press **Enter**.



On an IBM PC Network LAN segment, the LAN Manager lists the LAN segments on which the adapter address was found. Select the desired LAN segment and press **Enter**.

Duplicate addresses can occur on the same PC Network LAN segment if, while an adapter is opening on the network, another adapter is unable to respond to the duplicate address check. The LAN Manager cannot display the profile until the duplicate address condition is resolved.

Adapter Removal

Choose **Adapter Removal** to remove from the LAN segment:

- An adapter that is causing excessive errors
- An adapter to check whether it is the cause of slow performance.

Note: Be careful before removing an adapter from the network. For example, removing a bridge adapter can adversely affect the network. Review the functional address of the adapter to determine whether it is a bridge.

The LAN Manager displays the adapter profile to allow you to verify that you have chosen the correct adapter. On a token-ring LAN segment, if the LAN Manager is unable to provide the adapter information, you may still delete the adapter if you are certain it is the correct one.

Notes:

1. This function can also be performed from the host. See "Host Connection" on page 3-10.
2. The LAN Manager performing **Adapter Removal** must be a controlling LAN Manager.
3. If duplicate PC Network adapter addresses exist, all adapters with the specified address in the path between the LAN Manager and the specified adapter will be removed.

Duplicate Addresses: See "Duplicate Addresses" on page 8-7.

Manager Profile

Select **Manager Profile** to find the following:

- The adapter address of the LAN Manager's adapter
- Which LAN segment the LAN Manager is on.

To display information about the adapter on which the LAN Manager is running (your adapter), look at the manager profile.



For the Token-Ring Network, this function gives you the following information about the LAN Manager's adapter:

```
DFIPMP10                               IBM LAN MANAGER                               Page 1 of n
Normal                                  Manager Profile

Adapter address/name . . . . . : 400000000A1/LANMGR

LAN segment . . . . . : 001
LAN type . . . . . : Token-Ring 16 Mbps
NAUN address/name . . . . . : 01000000000/MGR02
Microcode level of adapter . . . . : 0001
Level of LAN Manager . . . . . : 002
Product ID . . . . . : 1005A082461
Group address . . . . . : 00000000
Functional addresses . . . . . : 00002008
                                  LAN Manager
                                  Ring Error Monitor

Esc=Cancel F1=Help F3=Exit

End PgDn
```

Figure 8-5. Manager Profile Panel: Token-Ring Network



For the IBM PC Network, this function gives you the following information about the LAN Manager's adapter:

```
DFIPMP20                               IBM LAN MANAGER          Page 1 of 2
Normal                                 Manager Profile

Adapter address/name . . . . . : 400000000A1/LANMGR

LAN segment/type . . . . . : 001
LAN type . . . . . : CSMA/CD/ LAN 2Mbps
Level of LAN Manager . . . . . : 002
Product ID . . . . . : 1005A002461
Group address . . . . . : 00000000
Functional addresses . . . . . : 00002008
                                LAN Manager
                                LAN Error Monitor

Esc=Cancel F1=Help F3=Exit

                                End PgDn
```

Figure 8-6. Manager Profile Panel: PC Network

Functional Name and Address

The LAN Manager's adapter has the functional names and addresses shown in Table 8-2. There may be additional functional addresses. The functional addresses shown here are those set by the LAN Manager.

Table 8-2. Possible Adapter Functional Addresses: LAN Manager's Adapter

Functional Addresses	Function Name	
	Token-Ring Network	PC Network
X'00002000'	LAN Manager	LAN Manager
X'00000010'	Configuration report server	None
X'00000008'	Ring error monitor	LAN error monitor

Adapter Definition

This function allows you to assign names to adapters to make it easier for operators to identify those adapters to the LAN Manager. You can add up to 6000 adapter definitions. You can monitor up to 1000 adapters.

Choose **Adapter Definition** to do the following:

- Display or print a list of all adapter names
- Mark adapters for critical resource monitoring
- Display operator comments about each adapter
- Add an adapter definition
- Change an adapter definition
- Find a name assigned to a particular adapter
- Delete an adapter definition.

Note: If you add, change, or delete any adapter definition, it is a good idea to back up the adapter definition file (DFIADEFS.DAT) afterward.

Adding an Adapter Definition

Select **Adapter Definition** from **Adapter Functions**. Select "Add." The **Add Adapter Definition** panel is displayed. At this panel, you can create a new adapter definition by entering the following data:

- Adapter name
- Adapter address
- Adapter monitored (yes/no)
- Comments (*optional*).

An alternative you can select "List" to display all existing adapter definitions. Then select "Add" from the **Adapter Definition List** panel.

Viewing an Adapter Definition

Select **Adapter Definition** from **Adapter Functions**. Then select "View." The **Adapter Definition Details** panel is displayed. This panel shows the following information:

- Adapter name
- Adapter address
- Adapter monitored (yes/no)
- Comments.

Changing an Adapter Definition

Select **Adapter Definition** from **Adapter Functions**. Select "View." The **Adapter Definition Details** panel is displayed. This panel shows the following adapter definition data:

- Adapter name
- Adapter address
- Adapter monitored (yes/no)
- Comments (*optional*).

You can change any data field on the panel by typing the new data over the old.

You may change the adapter name assigned to an adapter address. However, assigning a different adapter name to a particular adapter address affects the way you request event log reports. The event log records information by adapter address.

If you change an adapter name and request a report for...	This happens.
The previous adapter name	You receive a message indicating that no data exists in the event log for this adapter.
The current adapter name	The event log report translates the symbolic name into an adapter address and includes all the information for that address (including information for the adapter when it was assigned the previous symbolic name). The report is the same as if you had requested a report using the hexadecimal address.
The adapter address (hexadecimal)	The event log report includes all of the information for that address, regardless of previous or current adapter names. The report is the same as if you had requested a report using the current adapter name.

You may find it helpful to maintain a record of all previous and current adapter names and the hexadecimal addresses to which they were assigned. In that way, if you need a report of an adapter whose adapter name has been changed, you can request the report using the hexadecimal address instead.

You may also find it useful to back up the adapter definition file (DFIADEFS.DAT) periodically and whenever changes are made to the adapter names. You can use the COPY command in OS/2 to back up files.

Deleting an Adapter Definition

Select **Adapter Definition** from **Adapter Functions**. Select "View." The **Adapter Definition Details** panel is displayed.

To delete the adapter definition, press **F9 (Delete)**. A popup panel is displayed, prompting you to verify that you really do want to delete the adapter definition.

- Change (C)** Type "C" next to any line in the list. If you typed "C" on the top (blank) line, you must also supply an adapter name OR address in the blank field on that line. When you press **Enter**, the **Adapter Definition Details** panel will be displayed, showing the selected adapter's data.
- Delete (D)** Type "D" next to any line in the list. If you typed "D" on the top (blank) line, you must also supply an adapter name OR address in the blank field on that line. When you press **Enter**, a warning panel will appear to verify deletion request.
- Find (F)** Type "F" next to any line in the list. If you typed "F" on the top (blank) line, you must also supply an adapter name OR address in the blank field on that line. When you press **Enter**, the displayed list of definitions is adjusted so that the adapter specified next to the "F" is at the top of the list.
- Query (Q)** Type "Q" next to any line in the list. If you typed "Q" on the top (blank) line, you must also supply an adapter name OR address in the blank field on that line. When you press **Enter**, the **Request Adapter Profile** panel will be displayed and the name (or address, whichever you supplied) of the adapter will be filled in. Note that an adapter does not have to have a definition — More specifically, a name — in order to query it from this panel; the address will do.
- Remove (R)** Type "R" next to any line in the list. Remove works just like Query, except that the **Request Adapter Removal** panel will be displayed.
- View (V)** Type "V" next to any line in the list. View works just like Change. The two action words are provided instead of just *View*, or just *Change*, to make the menu easier to use.

You may also choose Special Function keys from the **Adapter Definition List** panel:

F4 (List monitored only)

Press **F4** to display only the adapter definitions that have "Monitored?" set to "Yes."

F8 (create print file)

Press **F8** to create a file called ADEFS.PRT. This file will contain the adapter definition list in printable format. You can print the file using the PRINT command in OS/2, or edit the file using an ASCII editor.

Adapter Definition Details

```
DFIPSN20                      IBM LAN MANAGER
Normal                          Add Adapter Definition

Type the information below and press Enter.

A Adapter name . . . . . [          ] 1 to 16 characters
B Adapter address . . . . . [          ] 12 hexadecimal digits
C Comments . . . . . [          ] 0 to 40 characters
D Monitor this adapter? . . . [N] Y=Yes, N=No

Enter  Esc=Cancel  F1=Help  F3=Exit  F5=Refresh
```

Figure 8-8. Add Adapter Definition Panel

A **Adapter Name.** The LAN Manager uses symbolic names or adapter addresses to identify adapters in functions that require adapter identification.

An *adapter name* may consist of a maximum of 16 characters in any combination of letters and numbers and four special characters (A-Z, 0-9, @, \$, %, #). It may not, however, contain exactly 12 characters in a combination of numbers and the letters "A-F." This restriction prevents an adapter name from having the appearance of an adapter hexadecimal address.

No distinction is made between uppercase and lowercase letters when an adapter name is defined or used. For example, the name "printsrv1" is stored as "PRINTSRV1" in the adapter definition file, and may be entered on a panel as "printsrv1" or "PRINTSRV1" or even "PrInTsRv1."

If you want to assign an adapter name but do not know the hexadecimal address, you may display or print a list of the hexadecimal addresses of all the active adapters on a LAN

segment by using the **Configuration List** under **Network Functions**.

B Adapter Address. The *adapter address* is a unique hexadecimal address exactly 12 characters long that is encoded in the adapter memory. Using the LAN Manager, you may assign a symbolic name that is easier to record and remember than the hexadecimal address.

C Comments. Enter up to 40 characters of your own comments about the adapter.

D Monitor this Adapter? Monitoring of an adapter begins immediately after you add or change an adapter definition. When the LAN Manager *monitors* an adapter, it generates an alert if any of the following conditions occurs:

- The adapter leaves the network.
- The adapter is not currently active on the network when monitoring begins and does not enter the network within several minutes.
- The adapter does not enter the network within several minutes after the LAN Manager is started or reset.

When a monitored adapter does enter the network, a message is recorded in the event log. You would normally want to monitor critical adapters, such as a file server or a print server.

Note: You can monitor up to 1,000 adapters at a time.

If you delete a monitored adapter from the adapter definition file, or remove the monitored adapter indicator, alerts will no longer be generated when that adapter leaves the network.

Removing the monitored adapter indicator from the adapter definition:

- Does not remove the adapter from the network
- Does not delete the name of the adapter from the adapter definition file.

Notes:

1. Monitored stations must support the Null Service Access Point (SAP). Refer to the *IBM Token-Ring Network Architecture Reference* for more information.
2. To monitor bridges, always monitor the bridge adapter that is on the LAN segment closer to the LAN Manager. The other bridge adapter may not be visible to the monitoring process.

Chapter 9. Bridge Functions

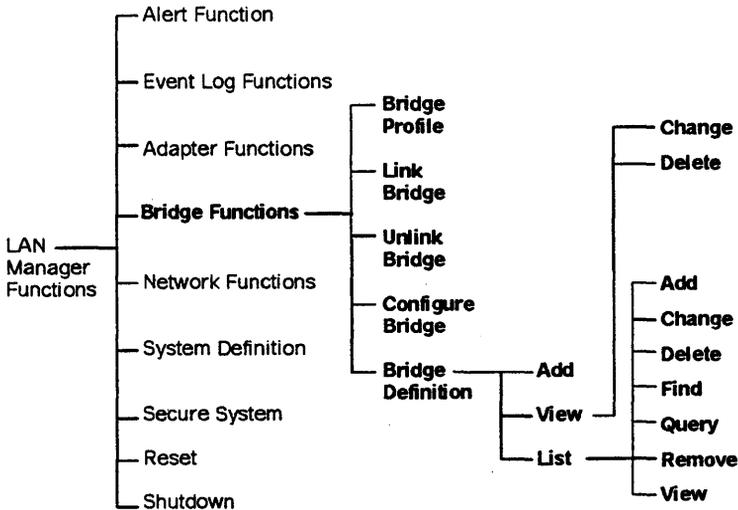


Figure 9-1. Bridge Functions

Choose **Bridge Functions** from the **LAN Manager Functions** panel to use any of the following functions:

- Bridge Profile
- Link Bridge
- Unlink Bridge
- Configure Bridge
- Bridge Definition.

About Bridges

A bridge is a logical and physical connection between two LAN segments. The LAN Manager can manage a maximum of 65 LAN segments.

A bridge is established using one of the following programs:

- The IBM Token-Ring Network Bridge Program, Version 2.1
- The IBM Token-Ring Network Bridge Program, Version 2.0
- The IBM Token-Ring Network Bridge Program, Version 1.1
- The IBM PC Network Bridge Program Version 1.0.

(See page 1-5 for details on which bridges connect which kinds of LAN segments.)

Note: The LAN Manager Version 2.0 does not support earlier versions of the IBM Token-Ring Network Bridge Program or other bridge programs not listed in this book.

A separate adapter in the bridge computer connects to each LAN segment. The Bridge Program passes frames from one LAN segment to the other, using the two adapters.

If you change the bridge configuration, you must do the following:

- Change the bridge definition (if the bridge number or LAN segments were changed)
- Change the reporting link password (if it was changed as part of the configuration change), and
- Relink to verify the changes.

In order for the LAN Manager to establish communications with bridges, you must do two things:

- Define each bridge to the LAN Manager.

Note: Make sure the parameters in the **Bridge Definition** match the parameters in the Bridge Program's bridge configuration. See "Bridge Definition" on page 9-17.

- Specify the reporting link and reporting link password the LAN Manager is to use to communicate with the defined bridges. See "Reporting Link" on page 3-6.

Bridge Profile

Choose **Bridge Profile** from the **Bridge Functions** panel to display the configuration parameters and performance counters of any bridge with which the LAN Manager can communicate.

```
DFIPQB02                               IBM LAN MANAGER                Page 1 of 3
Normal                                  Bridge Profile

Bridge name . . . . . : NS23

A Bridge version information . . . . . : 0100006403831
B Bridge type . . . . . : 0003
C Bridge number . . . . . : 4
D Largest frame size . . . . . : 2052
E Frame forwarding active . . . . . : Yes
F Single-route broadcast mode. . . . . : Automatic
G Performance notification interval . . : 00
H Percent frames lost threshold . . . . : 00.10
I Routing Information . . . . . : 063000110030

J LAN type . . . . . : CSMA/CD LAN 2Mbps      Token-Ring 4Mbps
K LAN segment . . . . . : 003                002
L Adapter address . . . . . : 10005A007C8E    10005A001B0A
M Adapter name . . . . . :
N Single-route broadcast . . . : Yes          Yes
O Hop count . . . . . : 7                    7

Esc=Cancel F1=Help F3=Exit

End Pg0n
```

Figure 9-2. (Part 1 of 3). Bridge Profile Panel

A Bridge Version Information. The version (2 digits), release (2 digits), modification level (2 digits), and program number (7 digits) of the bridge program for this bridge.

B Bridge Type.

- n001 - The bridge connects two token-ring LAN segments
- n002 - The bridge connects two PC Network LAN segments.
- n003 - The bridge connects a token-ring LAN segment to a PC Network LAN segment.

If n is 0, the bridge is a normal bridge. If n is 8, the bridge is an IBM Token-Ring Network Bridge Version 2.1 configured as a remote bridge.

C Bridge Number. The user-defined number used to distinguish between multiple bridges connecting the same two LAN segments. The bridge number is one hexadecimal digit.

D Largest Frame Size. The largest size frame in bytes that can go through the bridge.

E Frame forwarding Active

Yes The bridge is forwarding frames between the LAN segments it connects.

No The bridge is not forwarding frames between the LAN segments it connects.

F Single-Route Broadcast Mode

Automatic The bridge determines the single-route broadcast setting for each of the bridge adapters. This prevents multiple copies of the same frame on the same LAN segment, by controlling the specific route a frame can take.

Manual The LAN Manager specifies the single-route broadcast setting for each of the bridge adapters.

G Performance Notification Interval. The user-specified frequency (in minutes) with which the bridge sends performance counters to the LAN Manager. A zero frequency prohibits sending performance counters.

H Percent Frames Lost Threshold. The point at which the bridge sends an alert to the LAN Manager of excessive lost frames due to the target LAN segment being inoperative, adapter congestion, or other reasons. This threshold is frames lost per ten thousand, expressed as a percent.

Note: The IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge also has a Telecommunications Link Error Threshold. The value of this threshold indicates the point at which the bridge sends an alert to the LAN Manager of excessive lost frames due to telecommunications link errors. This threshold is accessible only at the bridge computer, not from the LAN Manager. Refer to the *IBM Local Area Network*

Administrator's Guide or the *IBM Token-Ring Network Bridge Program User's Guide*, Version 2.1, for more information about the Telecommunications Link Error Threshold.

- I** Routing Information. The specific path taken by the Bridge Profile request and response. If the bridge is attached to the LAN Manager's LAN segment, this field is blank. Note that the routing information displayed includes the route control field (first 4 characters) followed by the route (up to 32 characters).
- J** LAN Type of each of the two LAN segments. The LAN Type can be either Token-Ring or PC Network.
- K** LAN Segment. The hexadecimal segment number of each of the two LAN segments connected by the bridge.
- L** Adapter Address. The hexadecimal address of each of the two bridge adapters.
- M** Adapter Name. The symbolic name for the hexadecimal address of each of the two bridge adapters.
- N** Single-Route Broadcast.
 - Y Single-Route Broadcast is enabled for the adapter.
 - N Single-Route Broadcast is disabled for the adapter.
- O** Hop Count. The maximum number of bridges a broadcast frame can pass through before being stopped by this bridge.

Normal

Bridge Profile

P Date counter values reported by bridge : 10-03-88
 Time counter values reported by bridge : 11:09:03

Performance Counters

Frames forwarded values for:

LAN type :	CSMA/CD LAN 2Mbps	Token-Ring 4Mbps
LAN segment :	003	002
Q Broadcast frames :	1,627	1,832
Broadcast bytes :	49,481	57,414
R Non-broadcast frames :	318	287
Non-broadcast bytes :	10,985	7,754

Frames not forwarded because:

S Target LAN segment inoperative :	0	0
T Adapter congestion :	0	0
U Telecommunications Link Errors :		
V Other reasons :	5	0

Esc=Cancel F1=Help F3=Exit

Home PgUp
End PgDn

Figure 9-3. (Part 2 of 3). Bridge Profile Panel

- P** Date . . . Reported and Time . . . Reported indicate the date and time the performance counters were queried. Date is in MM-DD-YY format and time is in 24-hour format.
- Q** Broadcast Frames/Bytes. The number of Broadcast and Single-Route Broadcast frames and bytes that have passed through this bridge.
- R** Non-Broadcast Frames/Bytes. The number of frames and bytes directed to a specific address on a specific LAN segment across specific bridges that have passed through this bridge.
- S** Target LAN Segment Inoperative. The number of frames that did not pass through this bridge through this adapter because of a beaconing adapter, continuous carrier, no carrier, or 16 consecutive collisions on the LAN segment of the other bridge adapter.
- T** Adapter Congestion. The number of frames that did not pass through the bridge because of heavy traffic on this bridge adapter.

- U** Telecommunications link errors. The number of frames that did not pass through the bridge because of problems with the telecommunications link between the two bridge stations. This is applicable only to the IBM Token-Ring Network Bridge Program, Version 2.1, using the remote bridge function. For all other bridges this value is blank.
- V** Other Reasons. The number of frames that did not pass through the bridge because of problems with the frames, such as invalid routing information or invalid frame size.

The bridge performance counters are controlled by the bridge program and cannot be reset by the LAN Manager. They categorize by type the frames and bytes forwarded, and categorize by reason the frames *not* forwarded.

To determine the volume of frames and bytes in each category during a specific period of time, you will need to request the **Bridge Profile** at the beginning and end of the time period, and record the performance counters each time. The difference between the two performance counter readings is the volume of frames or bytes for that time period. See Appendix F, Bridge Performance Analysis, for the worksheet to record the performance counter readings.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

Bridge name : NS23

- LAN Manager on reporting link 0 . . : 10005A0005D1/
- LAN Manager on reporting link 1 . . : /
- LAN Manager on reporting link 2 . . : /
- LAN Manager on reporting link 3 . . : /

Esc=Cancel F1=Help F3=Exit

Home PgUp

Figure 9-4. (Part 3 of 3). Bridge Profile Panel

- LAN Manager on Reporting Link 0. The adapter address and name of the LAN Manager using Reporting Link 0 to communicate with this bridge. This is the controlling LAN Manager for this bridge.
- LAN Manager on Reporting Link 1/2/3. The adapter address and name of the LAN Managers using Reporting Links 1, 2, and 3, respectively, to communicate with this bridge. These are observing LAN Managers for this bridge.



Generally, the network administrator should determine when to request a bridge profile, and what to do with the information.

See Appendix F, "Bridge Performance Analysis" on page F-1 to learn how to use the performance counters to evaluate bridge traffic flow.

Link Bridge

Choose **Link Bridge** from the **Bridge Functions** panel to establish communication with a specific bridge temporarily. The communication with the bridge will be in effect until the next time the LAN Manager is reset or initialized. (If you want the link established automatically whenever the LAN Manager is reset or initialized, use the link option in the **Bridge Definition**.)

You may wish to establish a communication link with a bridge in the following situations:

- The link with the bridge went down or was taken down and needs to be reestablished
- Another bridge has had problems and you want to use this bridge in its place
- You use the bridge infrequently and do not want the link established automatically every time the LAN Manager is initialized or reset.

When you use this function, the bridge checks the reporting link number and password sent by the LAN Manager; the bridge rejects the link attempt if the authorization level and password do not match those defined to the bridge program. See "About Bridges" on page 9-2 and "Reporting Link" on page 3-6 for information about the authorization level and password.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

Unlink Bridge

Choose **Unlink Bridge** from the **Bridge Functions** panel to take down the communication link with a bridge temporarily.

If the bridge has automatic linking specified in the **Bridge Definition** it will again have an active communication link with the LAN Manager the next time the LAN Manager is initialized or reset.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

Configure Bridge

Select **Configure Bridge** from the **Bridge Functions** panel to view or change bridge parameters in a bridge.



Warning: Changes to bridge configurations may adversely affect the network. Be sure to verify any changes with your network administrator. Some changes may require changes at other stations in the network.

The **Configuration Parameters** panels are shown in Figure 9-5 on page 9-11. Information about each parameter is listed below the panel. If you change any bridge configuration parameter, you must unlink and link the affected bridges to make the changes take effect.

You can change bridge configuration parameters only from a controlling LAN Manager, or from a host.

Note: If you are linked to the IBM Token-Ring Network Bridge Program, Version 1.1, the only configuration parameter that can be changed is "single-route broadcasting."

```

DFIPCB02                                IBM LAN MANAGER                    Page 1 of 3
Normal                                  Configure Bridge Parameters

Type any changes and press Enter.

A Bridge name . . . . . : NS23

B Bridge number . . . . . : [4]
  (0-9, A-F)
  LAN segment number (001-FFF hexadecimal) . . : [003]
  Adapter . . . . . : 400000011111/BRDG021
  Segment type . . . . . : CSMA/CD LAN 2Mbps
C LAN segment connected to secondary adapter . : [002]
  Adapter . . . . . : 400000011112/BRDG022
  Segment type . . . . . : Token-Ring 16 Mbps
D Frame forwarding active . . . . . : [Y]
  (Y=Yes, N=No)
E Performance notification interval . . . . . : [00]
  (0-99 minutes, 0=stop notification)
F Percent frames lost threshold . . . . . : [00.10]

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh

End PgDn

```

Figure 9-5. Configure Bridge Parameters Panel (1 of 3)

- A** *(Display only)* The name you assigned to the bridge in the **Bridge Definition**.
- B** The bridge number you assign is one hexadecimal digit, and is used to distinguish this bridge among other bridges (if any) that connect the same two LAN segments. If you change the bridge number, you must also change the bridge definition. Select **Bridge Definition** and update the bridge definition. (This should be done at all LAN Managers in the network.)
- C** Information about the two LAN segments connected by the bridge. This information includes:
 - LAN segment number
 - Adapter name and adapter address of each bridge adapter
 - Type of each LAN segment.

You can change the LAN segment numbers. However, the adapter information and the LAN segment types are display only. If you change the LAN segment number, you must also change the associated bridge definitions.

Select **Bridge Definition List** and list by LAN segment to determine which bridge definitions must be changed. Then change the appropriate bridge definitions. (This should be done at all LAN Managers in the network.)

D Specifies whether the bridge can forward frames from one LAN segment to the other. It is a good idea to set frame forwarding active to "no" before changing bridge parameters that affect data flow, such as single-route broadcast, hop count, performance notification interval, or percent frames lost threshold. Then set frame forwarding active back to "yes" after the new bridge parameters are in effect.

E The bridge sends performance counter information to the LAN Manager at the interval you specify. The interval is in whole minutes, from zero to 99. To stop the sending of performance counters, specify an interval of zero. Sending automatically stops if the counter file fills up. (The file holds 1,440 records, enough for a record to be added once each minute for 24 hours.) The maximum size of each file is 145 KB.

Note: The performance counter information is written to a file called xxxxxxxx.PRF, where xxxxxxxx is the bridge name. You can print this file using the PRINT command in OS/2. See Appendix F, "Bridge Performance Analysis" on page F-1 for more information about this file.

F The point at which you want the bridge to send an alert to the LAN Manager of excessive lost frames due to the target LAN segment being inoperative, adapter congestion, or other reasons. The threshold value is the ratio of lost frames per 10,000 frames received, expressed as a percentage.

Note: The IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge also has a Telecommunications Link Error Threshold.

- The value of this threshold indicates the point at which the bridge sends an alert to the LAN Manager of excessive lost frames due to telecommunications link errors. This threshold is accessible only at the bridge computer, not from the LAN Manager.

- Filtered frames are not included in the bridge's threshold calculations for Percent Frames Lost or Telecommunications Link Errors.

Refer to the *IBM Local Area Network Administrator's Guide* or the *IBM Token-Ring Network Bridge Program User's Guide, Version 2.1*, for more information about the Telecommunications Link Error Threshold.

Type any changes and press Enter.

```
Bridge name . . . . . : NS23
K Single-route broadcast mode. . . . . : [A]
    (A=Automatic, M=Manual)
LAN segment . . . . . : 003           002
L Single-route broadcast setting . . . . . : [Y]           [Y]
    (Y=Yes, N=No)
M Hop count limit . . . . . : [7]           [7]
    (1-7)

Enter  Esc=Cancel  F1=Help  F3=Exit  F5=Refresh           Home PgUp
                                           End   PgDn
```

Figure 9-6. Configure Bridge Parameters Panel (2 of 3)

K Single-route broadcast is a way of preventing multiple copies of the same frame on the same LAN segment, by controlling the specific route a frame can take.

Automatic The bridges automatically set the single-route broadcast setting to prevent multiple copies of the same frame on the same LAN segment.

Manual The setting can be changed on one or both bridge adapters. The two bridge adapters may have different single-route broadcast settings.

L The current single-route broadcast setting of each bridge adapter. A setting of "Yes" means a single-route broadcast frame can pass through the bridge to the target LAN segment.

Single-route broadcast is a way of preventing multiple copies of the same frame on the same LAN segment, by controlling the specific route a frame can take.

You can change the setting on one or both bridge adapters. Use caution in deciding to change a setting manually: changing the setting in this function changes the single-route

broadcast mode to M (Manual). The settings remain as you entered them until you change them again or until you change the single-route broadcast mode to A (Automatic). The two bridge adapters may have different single-route broadcast settings.

H

The maximum number of bridges a broadcast frame can pass through (the *hop count*) before being stopped by this bridge. The maximum hop count value is seven.

Hop count and single-route broadcast work together to control the flow of frames and prevent duplicate frames on a LAN segment.

**Network
Administrator**

The network administrator or planner determines which bridge adapters should have the single-route broadcast setting “on,” and what the bridge hop count should be.

If the single-route broadcast setting is “no” for a bridge adapter, single-route broadcast frames do not pass through the bridge. Broadcast frames are not affected by the single-route broadcast settings, and may pass through any bridge.

Normal

Type any changes and press Enter.
Passwords must be 6-8 alphanumeric characters.

Bridge name : NS23

M Link password 0 . . . []

Link password 1 . . . []

Link password 2 . . . []

Link password 3 . . . []

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh

Home PgUp

Figure 9-7. Configure Bridge Parameters Panel (3 of 3)

- M** Reporting link passwords. There is a password for each authorization level (0 = controlling; 1, 2, 3 = observing). These passwords must match the passwords entered when the bridge program is configured. If you change a reporting link password, you must also update the password at all LAN Managers in the network that use the affected reporting link.

Bridge Definition

At the **Bridge Definition** panel, you can:

- Add a bridge definition
- View a bridge definition
- List all bridge definitions.

If you select “View” you can also change or delete the bridge definition. If you select “List,” you can also perform any of the following functions:

- Add a bridge definition
- Change a bridge definition
- Delete a bridge definition
- Find a bridge definition
- Query a bridge profile
- Remove a bridge definition
- View a bridge definition.



A worksheet is provided in Appendix D, Worksheets, to help prepare bridge definitions. The network administrator should fill out this worksheet with the proper settings.

Adding a Bridge Definition

To identify the bridges on the network to the LAN Manager, you must add a bridge definition for each bridge. The **Add Bridge Definition** panel is shown in Figure 9-8 on page 9-18.

```

DFIPBD30                      IBM LAN MANAGER
Normal                          ADD BRIDGE DEFINITION

Type the information below and press Enter.

[A] Bridge name . . . . . [      ]           1 to 8 characters
[B] Bridge number . . . . . [ ]             1 hexadecimal digit
[C] Link during bringup? . . . . . [N]

LAN segment number . . . . . [ ]           3 hexadecimal digits
Adapter address or name . . . . . [      ]
[D] LAN segment number . . . . . [ ]       3 hexadecimal digits
Adapter address or name . . . . . [      ]

[E] Comments . . . . . [      ]

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh

```

Figure 9-8. Add Bridge Definition Panel

A The bridge name is one to eight characters long and is the name by which the LAN Manager identifies the bridge. A bridge name may consist of a maximum of eight characters in almost any combination of letters and numbers and four special characters (A-Z, 0-9, @, \$, %, #). The string "UNKNOWN" is invalid, whether entered in upper case, lower case, or a combination.

B The bridge number is a single hexadecimal digit assigned by the network administrator to uniquely identify a bridge among other bridges connecting the same two LAN segments.

Note: The bridge number must match the number assigned to the bridge in the bridge program configuration.

C Enter "Y" if you want to link to the bridge automatically whenever the LAN Manager is restarted.

D The LAN segment and adapter information define the connections to the bridge (topology).

E Enter any comments or notes that pertain to the bridge.

Viewing or Changing a Bridge Definition

Select **Bridge Definition** from the **Bridge Functions** panel. The **Bridge Definition Details** panel is displayed. Type over any information you wish to change.

Listing All Bridge Definitions

The **Bridge Definition List** panel displays a list of all bridges defined to the LAN Manager. The list is in alphabetical order by bridge name, and can also be listed by LAN segment number by using the **F4** key.

```
DFIPBD20                      IBM LAN MANAGER      Items 1 to 4 of 4
Normal                          Bridge Definition List

Type an action letter next to a bridge name and press Enter, or
type an action letter and bridge name on the first line and press Enter.
Linked bridges are marked with an asterisk (*) beside the bridge name.

          Add Change Delete Find Query View

Action  Bridge  Link at  LAN  Bridge  LAN  Comments
        Name    Bringup? Seg  Number Seg
-----
-      BRIDGE1 * NO    003   1    004
-      BRIDGE2  NO    004   1    005
-      BRIDGE3 * NO    004   2    005
-      BRIDGE4  NO    002   1    003
-
-
-
-

Enter Esc=Cancel F1=Help F3=Exit F4=List by LAN segment
F5=Refresh
```

Figure 9-9. Bridge Definition List Panel

An asterisk (*) next to a bridge indicates that the bridge is currently linked. Use **PgUp**, **PgDn**, **Home**, and **End** to scroll the list.

From the **Bridge Definition List** panel you can:

- Add a bridge definition
- Find a bridge definition
- Change a bridge definition

- Delete a bridge definition
- Query the bridge profile if the bridge is currently linked
- View a bridge definition.

There are two ways to locate a bridge definition:

- Select the “Find” function
- Scroll through the list of bridges on the **Bridge Definition List** panel until you find the bridge you want.

The Find operation adjusts the displayed list. View or Change takes you to the **Bridge Definition Details** panel, where you can make changes if desired.

Any changes you enter take effect the next time the LAN Manager establishes the link with the bridge (at initialization, reset, or through the **Link Bridge** function).

Deleting a Bridge Definition

Select **Bridge Definition** from the **Bridge Functions** panel. Then select the “View” function. The **Bridge Definition Details** panel is displayed.

To delete the bridge definition, press **F9 (Delete)**.

An alternative method is to select “Delete” from the **Bridge Definition List** panel (See Figure 9-9 on page 9-19).

If you delete a bridge definition, the LAN Manager will not be able to use that bridge to communicate with the LAN segments connected by that bridge. Deleting a bridge definition does not remove a bridge from the network; it removes knowledge of the bridge from the LAN Manager.

Delete a bridge definition that:

- You no longer need or want to use
- You want to assign to another bridge
- Belongs to a bridge that is no longer physically attached to the network.

If you are not certain which bridge you wish to delete, you may request that the LAN Manager find a particular bridge definition so that you can review it before deleting it.

Note: A bridge definition cannot be deleted if the bridge is currently linked.

Chapter 10. Network Functions

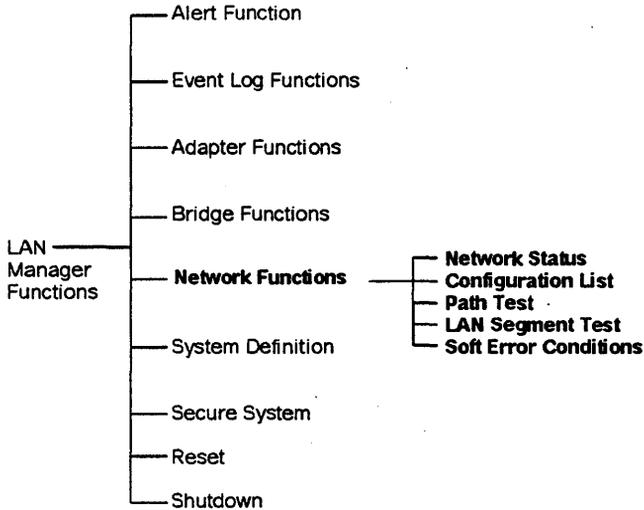


Figure 10-1. Network Functions

The functions available under **Network Functions** are shown in Figure 10-1.

This chapter describes each function and suggests when to use it.

Network Status

Use **Network Status** to get the following information:

- Display the status of all managed LAN segments in the network
- Identify which bridges on each LAN segment are currently linked to the LAN Manager.

The status information can tell you if the network has a problem, but the information is correct only for the time of the network status request. That status information changes only when automatic error recovery has failed to resolve the problem on the network, and should not be used when following the procedures in the *Problem Determination Guide*. You will need to go to a bridge or other observer device on the affected LAN segment to perform any problem determination using the *IBM Token-Ring Network Problem Determination Guide*.

The LAN segments are listed in ascending LAN segment number order on the **Network Status** panel. You have the option on this panel to list the LAN segments in ascending bridge name order. An asterisk marks the LAN segment to which the LAN Manager is attached.

```

DFIPNS10                      IBM LAN MANAGER                      Page 1 of 1
Normal                        Network Status by Segment                      ALERT

The local LAN segment is marked with an asterisk (*) beside its number.

LAN Segment  LAN Segment Status  LAN Segment Type  Linked Bridges on
Number
-----
001 *      Normal      Token-Ring 16 Mbps  BRD601
002      Normal      Token-Ring 4 Mbps   NS23, BRD601
003      Normal      CSMA/CD LAN 2 Mbps  NS23

Esc=Cancel  F1=Help  F3=Exit  F4=List by bridge  F5=Refresh

End PgDn

```

Figure 10-2. Network Status by Segment Panel

When the status changes, you will receive messages either in the form of alerts or error messages displayed on your screen or in the event log. These messages and alerts give you more information about what may have caused the status to change. Messages are described briefly in Appendix A, LAN Manager Messages. Event log messages can be displayed in detail using the **Event Log** function of the LAN Manager. Alert information can be displayed using the **Alerts** function of the LAN Manager.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

The LAN Manager status conditions are shown in Table 10-1 on page 10-4.

Table 10-1 (Page 1 of 2). Network Status Conditions

Status	Description
<p>Normal</p>	<p>The LAN Manager is processing information and the LAN segment is operating normally.</p>
<p>Soft Error</p> 	<p>This status condition applies only to Token-Ring Network LAN segments.</p> <p>The LAN segment is experiencing intermittent failures that cause data to be transmitted on the LAN segment more than once in order to be received correctly. The alert that accompanies the Soft Error status includes the fault domain (the segment of the network experiencing the failures).</p>
<p>Beaconing</p> 	<p>This status condition applies only to Token-Ring Network LAN segments.</p> <p>The LAN segment is experiencing an error condition detected by an adapter when there is either signal loss (possibly caused by a broken line) or no token is circulating the LAN segment within the predefined time limit. Beaconing indicates that the LAN segment is inoperative.</p> <p>The status on the Network Status panel will not change to Beaconing until the LAN segment experiencing the problem has gone into a permanent beaconing condition (when the LAN segment has failed to recover during the auto-removal process). You can look at the alert received to find the fault domain.</p>

Table 10-1 (Page 2 of 2). Network Status Conditions

Status	Description
<p>Continuous Carrier</p> <p>PC Network</p>	<p>An IBM PC Network adapter or the modem on the adapter is in a continuous <i>transmit</i> mode. No other IBM PC Network adapters can transmit until the problem is resolved. The bus is inoperative. The bus can automatically recover of the problem adapter removes itself. Otherwise you may receive an alert indicating the failing device. Continuous carrier is sometimes called <i>hot carrier</i>.</p> <p>Continuous carrier is indicated by one of the following messages:</p> <p>DFIPD209* Auto-removal error</p> <p>DFIPD350 Network inoperative — continuous carrier detected</p> <p>DFIPD352* Network recovery failed — continuous carrier</p> <p>DFIPD353 Network recovered from continuous carrier</p> <p>DFIPD354* Network recovered — adapter removed</p> <p>DFIPD355* Continuous carrier — source unknown</p> <p>Note: An asterisk (*) beside a message indicates an alert.</p>

Configuration List (Active Adapters on a LAN Segment)

Select **Configuration List** from **Network Functions** to display or print a list of active or open adapters on a single LAN segment at a time. To find a specific adapter, use the FIND function or the scrolling keys.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

```

DFIPT020                      IBM LAN MANAGER                      Page 1  of 2
Normal                        LAN Segment Configuration List

Type an action letter next to an adapter address and press Enter, or type
an action letter and adapter address or name and press Enter.

LAN segment . . . : 001      Time . . . : 11:11:59      Date . . . : 10-03-88

                                Find Query Remove

Action  Adapter      Adapter      Function      Group
Address Name                                     Address
-----
-      10005A0005D1      LAN Error Monitor      00000000
-      Configuration Report Ser
-      LAN Manager
-      10005A001B2C      Active Monitor          00000000
-      LAN Parameter Server
-      LAN Error Monitor

Enter  Esc=Cancel  F1=Help  F3=Exit  F5=Refresh
F8=Create print file                      End  PgOn
  
```

Figure 10-3. LAN Segment Configuration List Panel

To print the configuration list, press **F8** to create a printable file called CONFIGRA.PRT. Then use the PRINT command in OS/2 to print the file, or edit the file using an ASCII editor.

A rectangular icon with a dotted background and a black border. The text "Token-Ring Network" is centered within the rectangle in a bold, sans-serif font.

**Token-Ring
Network**

For a specified token-ring LAN segment, **Configuration List** will display a list of active adapters on the LAN segment in upstream order. The list allows you to do the following:

- Determine the NAUN (Nearest Active Upstream Neighbor) of the active adapters on the LAN segment at the time of request
- Learn the adapter names of the active adapters on the LAN segment
- See the functional and group addresses for each adapter on the LAN segment.

On a local LAN segment, the first adapter on the list is the LAN Manager's adapter. On a remote LAN segment, the first adapter on the list is the bridge adapter. The second adapter on the list is the first adapter's NAUN. The third adapter on the list is the second adapter's NAUN and so on.

For a specified IBM PC Network LAN segment, **Configuration List** will display a list of open adapters on the LAN segment. If more than 1000 adapters are on the LAN segment, only the first 1000 open adapters are on the list.

There may be a slight delay between the time an adapter is turned on and the time the LAN Manager is notified the adapter is present and includes the adapter on the list. You may need to wait a minute or two before requesting the configuration list, in order to see the adapter on the list.

Note: If the LAN segment status is other than **Normal** (such as **No carrier** or **Continuous carrier**) when the configuration list is displayed, the list may not be complete.

The LAN Manager provides the time and date of the list, and the following information about each adapter on the list:

- Adapter name, if one has been assigned
- Hexadecimal address
- Adapter function
- Group address (if one has been assigned by an application program).

Path Test



The **Path Test** function applies to Token-Ring Network LAN segments only.

If a PC Network LAN segment appears anywhere in the path between the LAN Manager and the source adapter, or between the source adapter and the destination adapter, the Path Test will not be completed.

In order to run the **Path Test**, the LAN Manager must be a controlling LAN Manager. *Use this function only if the LAN Manager is a controlling LAN Manager.* See "Reporting Link" on page 3-6 for information about controlling and observing LAN Managers.

Choose **Path Test** to check the path between two adapters to be sure the two adapters can communicate.

The adapters must be on different LAN segments, and can have no more than seven bridges between them. You must specify the two adapters, and the route between them. The route consists of the ring number (3 digits) of the source adapter specified, followed by the bridge number (1 digit) and target ring number (3 digits) for each subsequent bridge in the path. The last ring number in the path must be the ring number of the target adapter specified.

For example, 00A101D means from ring 00A through bridge number 1 to ring 01D. An alternative method to describe the routing information is to list the the bridges that make up the path. The last bridge on the path must be able to communicate with the LAN Manager.

If the path test fails, you may receive an alert soon after. Go to the **Alerts** function for information about the possible cause of the failure.

If one of the adapters you have listed encounters an error, you receive an error message and the cursor is positioned under the adapter that has the error condition.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

LAN Segment Test

Choose **LAN Segment Test** to do the following:

- Check whether the LAN Manager's adapter can communicate over its LAN segment after you have installed the LAN Manager
- Determine whether a specified LAN segment can transfer data and, if not, view the fault domain information.

You will receive a message on your screen indicating whether the test completed successfully or failed. If the test succeeded, you will receive the message "Operation completed successfully."

If the test failed due to a condition other than beaconing or continuous carrier, you will receive the message "Operation failed."

If the test failed due to beaconing, error information identifying the fault domain and beacon type will be displayed on the **LAN Segment Test Results** panel.

If the test failed due to continuous carrier, error information identifying the source address will be displayed on the **LAN Segment Test Results** panel.

If the test failed, you may receive an alert soon after. If you do, check the **Alerts** function for information about the possible source of the problem. If you get no alert, check the event log for indications of the problem.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

Soft Error Conditions



The **Soft Error Conditions** function applies to Token-Ring Network LAN segments only.

The LAN Manager allows you to determine the adapters that may be degrading a LAN segment's performance by displaying a list of up to ten adapters that are experiencing soft errors at the time of the request.

Choose **Soft Error Conditions** in the following circumstances:

- When the recommended actions for an alert indicate that you should use this function
- When the *IBM Token-Ring Network Problem Determination Guide* indicates that you should use this function.

Note: An adapter that has been removed may stay on the **Soft Error Conditions** panel for several minutes, but refreshing the panel after a few seconds should show that the Error Count is decreasing for the adapter.

The **Soft Error Conditions** displays a list of adapters on a specified LAN segment that are experiencing soft errors.

DFIPAC80
Normal

IBM LAN MANAGER
Soft Error Conditions

LAN Segment . . . : ____

Type an action letter next to an address, and press Enter.

		Query	Remove	
Select	Condition	Adapter Address	NAUN Address	Error Counts
-----	-----	-----	-----	-----
-	**	10005A0002AB	10005A000057	80
-	*	10005A000157	10005A000060	80
-		10005A00012A	10005A00002A	20
-				
-				
-				
-				
-				
-				
-				
-				

Enter Esc=Cancel F1=Help F3=Exit F5=Refresh

Figure 10-4. Soft Error Conditions Panel

Adapters that are in the *pre-weight-exceeded* condition have a single asterisk (*) in the "Condition" column. As the weight reaches a pre-defined level, it is in *pre-weight-exceeded* condition. Adapters that are in the *weight exceeded* condition have double asterisks (**) in the "Condition" column. Weight is a measure of the number of soft errors the adapter is experiencing.

Chapter 11. Other LAN Manager Functions

This chapter contains descriptions of the following LAN Manager functions:

- Secure System
- Reset
- Shutdown
- Remove password protection
- Import/export utility.

Secure System

Use **Secure System** whenever you want to leave the LAN Manager console without shutting down the LAN Manager and want to protect the LAN Manager functions from unauthorized use.

The operator password must be defined before the **Secure System** function can operate. See "Security (Setting the Password)" on page 3-5 for information about the operator password.

When you select **Secure System**, if a password has been defined, the operator password panel is displayed. See "Security (Setting the Password)" on page 3-5. You can then leave the console, if desired. The LAN Manager continues to manage the network but does not remove the operator password panel. When you return to the console, enter the operator password to remove the password panel and reaccess the LAN Manager functions.

Note: Host commands can still be received and executed after **Secure System** has been selected.

You may also use **Secure System** prior to jumping to another OS/2 session on your computer, so that you do not have to return to the LAN Manager session from another session in order to secure the LAN Manager before leaving the console. From the LAN Manager operator password panel you can use the OS/2 **Alt-Esc** or **Ctrl-Esc** keys to go to another session. The LAN Manager operator password panel will be redisplayed when you return to the LAN Manager session.

Reset (Reinitialize the LAN Manager)

Choose **Reset** from the **LAN Manager Functions** panel if you want to restart the LAN Manager without returning to OS/2.

Reset does not physically close the adapter. It just reinitializes its session with the adapter.

Note: This function can also be performed from the host. See "Host Connection" on page 3-10.

Shutdown

Select **Shutdown** if you wish to end the LAN Manager and return to OS/2. Selecting **Shutdown** from this panel returns you to the OS/2 **Task Selection** panel.

Note: Shutdown does not physically close the adapter. It only terminates the session.

Removing Password Protection

The following procedure allows you to erase an existing password if you have forgotten it or if you want to remove password protection. Once you have completed these steps, if you want to have a password you will need to start the LAN Manager and set a new password using the instructions on page 3-5. Follow the directions below to erase an existing password.

1 Make sure the OS/2 prompt is displayed, with the LAN Manager shut down, and the default drive set to the fixed disk on which the LAN Manager is installed.

2 Type:

CD\LANMGR

and press **Enter**.

3 Insert the *IBM LAN Manager Diskette 1* into drive A.

4 Type:

A:RESETPW

and press **Enter**.

5 A message is displayed, indicating the success or failure of the operation.

Import/Export Utility

You can use adapter names instead of adapter addresses to specify adapters in LAN Manager or host commands that require adapter identification. The LAN Manager program has an Export Utility that converts the Adapter Names file (DFIADEFS.DAT) used by the LAN Manager program into an adapter names utility file that can be edited. The program also has an Import Utility that converts the adapter names utility file into the Adapter Names file. This section explains how you use these facilities.

Each adapter has encoded in its memory a unique hexadecimal address that is 12 characters long. Using any ASCII editor that provides a carriage-return/line-feed character, the network operator can create an adapter names utility file to assign a symbolic adapter name to an adapter. A symbolic adapter name is easier to record and remember than the adapter's hexadecimal address.

A symbolic adapter name may consist of a maximum of 16 characters in any combination of letters and numbers and four special characters (A-Z, 0-9, @, \$, %, #). So that a symbolic adapter name will not have the appearance of an adapter hexadecimal address, it may not contain exactly 12 characters in a combination of numbers and the letters "A - F." The Adapter Names file holds up to 6,000 symbolic names.

Each line of an adapter names utility file contains the following four fields and ends with a carriage-return/line-feed character that does not print:

```
adapter_address  adapter_name  "comment"  monitor_indicator
```

The first field is the 12-character adapter address, and is required. This address cannot be a group or functional address. The second field is the symbolic name, and can be up to 16 characters long. This field is also required. The third field is for comments and can be up to 40 characters long. Comments are optional and must be enclosed in double quotes. The fourth field is for indicating, with the letter "Y" or "N," whether the adapter is to be monitored as a critical resource. The letter "Y" (for yes) indicates monitoring is required; the letter "N" (for no) indicates monitoring is not required. The letter can be entered in either upper- or lower-case. "N" is the default value. As an example, a line in an adapter names utility file may look like this:

```
000467AF9827 phoenixadapter "the phoenix adapter" y
```

The program checks all input fields to ensure that they do not exceed the correct length and that the characters specified are valid. The program creates a file named IMPORT.ERR for invalid records and provides accompanying explanations. You may use any editor to read this file.

Using the Import Utility

The Import Utility converts the adapter names utility file into the Adapter Names file that is used by the LAN Manager.

To use the Import Utility, you must specify:

1. The utility name, **import**.
2. The name of your adapter names utility file. The LAN Manager program converts the name of the file that you specify into the DFIADDFS.DAT file that is used by the LAN Manager.

For example, to import a file specify the following:

```
import symfile.mgr
```

Using the Export Utility

The Export Utility converts the DFIADDFS.DAT file into an adapter names utility file that can be edited. The adapter names appear in alphabetical order.

To use the Export Utility, you must specify two things:

1. The utility name
2. The name of the adapter names utility file.

For example, to export the DFIADDFS.DAT file specify the following:

```
export names.mgr
```

Chapter 12. Basic Troubleshooting

This chapter includes some hints about using the LAN Manager to find problems on the network.

Token-Ring Network

For detailed procedures, see the *IBM Token-Ring Network Problem Determination Guide*. To investigate problems between adapters that cannot communicate, see "Adapters Not Communicating" on page 12-5. This chapter offers suggestions for solving a variety of problems:

- Those that are currently occurring
- Those that have occurred prior to troubleshooting
- Those that exist between two adapters that cannot communicate.

PC Network

For detailed procedures, refer to *IBM PC Network Hardware Maintenance and Service*.

LAN Manager and LAN Segment Status Problems

The following are some suggestions for analyzing problems that either have been reported by someone using an adapter on the ring or by an alert indication on a LAN Manager functions panel.

Check the local LAN segment status in the upper left corner of any LAN Manager functions panel. Use the **Network Status** function for the status of remote LAN segments. Table 12-1 shows the possible LAN segment statuses and suggested actions for each status.

Table 12-1 (Page 1 of 2). LAN Segment Status Problem Analysis	
LAN Segment Status	Suggested Action
Normal	Request an Adapter Profile for the adapter that has the problem to see if the adapter is still active on the ring. (It is helpful to know whether it is active as you continue troubleshooting.) Use the problem determination procedures in the documentation for the application program that is using that adapter.
Beaconing 	Go to Alert Functions and look for the most recent beaconing alert (DFIPD202-204). Record the message number for that alert (found under the description on the Alert Details panel). Follow the recommended actions for that alert.
Soft Error 	Go to Alert Functions and look for the most recent alert with the short description DFIPD101 "Error limit exceeded." Go to the panel with details for that alert. Using the text message information, follow the instructions for message DFIPD101 in Appendix A, LAN Manager Messages.
Wire Fault or Adapter Closed	Go to Alert Functions and look for the most recent alert for that LAN segment. Record the message number for that alert (found under the description on the Alert Details panel). Follow the Recommended Actions for that alert.

Table 12-1 (Page 2 of 2). LAN Segment Status Problem Analysis	
LAN Segment Status	Suggested Action
Data Lost	The LAN Manager cannot log errors or configuration changes as fast as they occur. Some error information will be lost.
Continuous Carrier 	Go to Alert Functions and look for the most recent continuous carrier alert (DFIPD352, DFIPD355, or DFIPD356). Record the message number for that alert (found on the Alert Details). Follow the instructions on the Recommended Actions panel.
No Carrier 	Go to Alert Functions and look for the most recent no carrier alert (DFIPD356). Follow the instructions on the Recommended Actions panel.
Unknown	Select Retry or Reset. If state is still unknown, shut down the LAN Manager and run the adapter diagnostics. Verify communications manager profile. (refer to <i>OS/2 User's Guide</i> .)

Alert Status Problems

Go to **Alerts** and check for an alert that occurred prior to the time the problem was reported. Table 12-2 shows alert conditions and suggested actions.

Error limit exceeded	<p>Check the event log for the adapter indicated in the alert message. Check to see if the message "Ring errors decreasing" was logged for that adapter.</p> <ul style="list-style-type: none">• If it was not logged before the time of the problem, then the ring was still experiencing excessive soft errors that may have caused the problem.• If it was logged, continue searching for alerts that indicate the source of the problem.
Ring not working	<p>Check the event log for the message "Ring recovered" or "Ring recovered — adapter removed."</p> <ul style="list-style-type: none">• If the message was not logged before the time of the problem, then beaconing was the cause of the problem.• If either of these messages was logged, check to see if the adapter reporting the problem was removed.<ul style="list-style-type: none">— If it was removed, then that adapter was the cause of the problem.— If it was not removed, continue to look for the problem.
Other alerts	<p>If none of the alerts in the preceding list occurred, look at the event log.</p>
No alerts	<p>If no messages were logged at the time of the problem, then the IBM LAN Manager was not aware of the problem.</p>

Adapters Not Communicating

Use the following procedure when two adapters cannot communicate and you have no indication of hardware errors, no beaconing messages, or an unusual level of soft errors.

Before you begin, start the LAN Manager.

Using the **Adapter Profile** function, verify that both adapters are active on the network.

If both are active, and the path only crosses token-ring LAN segments, begin with step 1 of the following procedure.

Otherwise, begin with step 6 on page 12-6.

1 Run a "Path Test" between the two adapters.

If the test is successful, continue with step 2.

Otherwise, go to step 4 on page 12-6.

2 Check the application programs that are running in each adapter. Have they been correctly configured? Are they using the correct addresses and symbolic names? (Other applications may call them "network names," "aliases," or some other similar term).

If the configuration, addresses, and names are correct, this procedure has failed to locate the problem. Refer to the *IBM Token-Ring Network Problem Determination Guide*.

Otherwise, continue with step 3.

3 Correct the error and retry the operation that failed; then return to this step.

If the operation no longer fails, you have recovered from the problem. Do not continue with this procedure.

Otherwise, this procedure has failed to locate the problem. Do not continue with this procedure. Refer to the *IBM Token-Ring Network Problem Determination Guide*.

- 4** Run all of the available diagnostics on one adapter.
If the diagnostics indicate an error, correct the problem.
Otherwise, continue with step 5.
- 5** Run all of the available diagnostics on the other adapter.
If the diagnostics indicate an error, correct the problem.
Otherwise, this procedure has failed to locate the problem.
Consult the *IBM Token-Ring Network Problem Determination Guide*.
- 6** Make sure that the adapter that was not active on the ring during the request for an adapter profile has been made active. Restart its application program or start the LAN Manager on that adapter. Verify that the correct adapter address is being used.
- 7** Request an adapter profile for the adapter that was previously not active on the ring.
If it is now active, you have recovered from the problem and do not need to continue with this procedure.
Otherwise, continue with step 8.
- 8** Run all of the adapter diagnostics available on the adapter that remains not active on the ring.
If the diagnostics indicate an error, correct the problem.
Otherwise, this procedure has failed to locate the problem.
Consult the *IBM Token-Ring Network Problem Determination Guide*.

Appendix

Appendix A. LAN Manager Messages

Types of Messages

You may encounter three types of messages while running the LAN Manager. They include:

- I:** Information. An information message tells you about non-critical activity on the network or with the LAN Manager program.
- W:** Warning. A warning message indicates a potential problem on the network or with the LAN Manager program.
- E:** Error. An error message is more serious than a warning message and tells you about a problem on the network or with the LAN Manager program.

How Messages are Displayed

Messages may be displayed in three ways:

- On the *message line*: Messages that are displayed here contain only the message number and a written description.
- As an *alert*: An alert, a special type of message, appears as an "ALERT" on the second line of the screen, accompanied by a beep. (To see a description of the alert, you need to return to the **LAN Manager Functions** panel and then select "Alerts.") All network alert messages are recorded in the event log and alerts file of all LAN Managers on the network with the exception of alert DFIPD990. Alert messages concerning a failure in a LAN Manager, its adapter, or any of its bridge links are recorded in the event log and alert file of that LAN Manager only.
- In the *event log*: Messages that are not displayed on the message line on the screen are recorded in the event log with the date, time, and any additional data associated with the message, such as LAN segment number or adapter address. Help panels in the Event Log function provide further explanation of data fields when required.

All of the LAN Manager messages are listed in this appendix by message ID number. A brief explanation of the message meaning is included. For alerts, suggestions for action to take are included. Data related to these messages can be found in the Event Log.

Running Adapter Diagnostics

- Some messages instruct you to run diagnostics on the Token-Ring Network adapter (see the next bullet for diagnostics on the PC Network adapter).
 - If you have an IBM Personal Computer (these computers use an IBM Token-Ring Network Adapter or Adapter II):

Run the Adapter Diagnostics described in the *IBM Token-Ring Network PC Adapter Guide to Operations*. If you have the *IBM Token-Ring Network PC Adapter Hardware Maintenance and Service* manual and diskette, use the Advanced Diagnostics instead.
 - If you have an IBM Personal System/2 Model 50, Model 60, Model 70 or Model 80 (these computers use an IBM Token-Ring Network Adapter/A):

Run the tests located on the IBM Personal System/2 Reference Diskette as described in "Problem Solving" in the *IBM Token-Ring Network Adapter/A Installation and Testing Instructions*. If you have the *IBM Token-Ring Network Adapter/A Hardware Maintenance Reference and Service*, use the Advanced Diagnostics that were copied to the Reference Diskette, instead. See the *IBM Token-Ring Network Adapter/A Hardware Maintenance Service* section of the *IBM Personal System/2 Hardware Maintenance Service* manual for instructions on running the Advanced Diagnostics.

When you have run the diagnostics, return to the alert or error message that brought you here.

- Some messages instruct you to run diagnostics on the PC Network adapter.
 - Turn the computer off, wait about 15 seconds, turn it on again, and look for any error messages.

- If you have the *IBM PC Network Hardware Maintenance and Service* manual and diskette, run the Advanced Diagnostics tests located on the diskette.

Reinstalling the LAN Manager

If for any reason it becomes necessary to reinstall the LAN Manager, you should complete the following steps:

- 1 Back up the following files:

DFIADEFS.DAT	Adapter definition file
DFIEVENT.LOG	Event log file
DFIALDET.LOG	Alert detail file
DFISYS.DAT	System parameters file
DFIBDEFS.DAT	Bridge definition file, if any
- 2 Install the LAN Manager again.
- 3 Restore the files you backed up. However, do *not* restore any file that contributed to a LAN Manager problem.

List of LAN Manager Messages

- DFIPD001 I LAN Manager started**
Meaning: The LAN Manager has completed initialization and is ready for operation.
- DFIPD002 I Operation in progress, please wait**
Meaning: The program is performing an operation that you requested.
- DFIPD006 I Operation completed successfully**
Meaning: The operation you requested has been completed.
- DFIPD007 I Operation failed**
Meaning: The operation you requested has failed.
- DFIPD010 I Full soft error logging enabled**
Meaning: Full soft error logging has been started for this LAN segment by selecting that option from the **Change Soft Error Logging** panel. In addition to soft error alerts, the following soft error messages will be logged:
- DFIPD102 Ring errors increasing
 - DFIPD103 Ring errors decreasing
 - DFIPD104 Recovered error counters
 - DFIPD106 Soft error detected
 - DFIPD108 Ring poll failure
 - DFIPD109 Ring monitor error.
- Full soft error logging for this LAN segment remains in effect until its logging option is changed or until the LAN Manager is reset or initialized.
- DFIPD011 I Soft error logging disabled**
Meaning: You have changed the soft error logging for this LAN segment from FULL or Limited to None, by selecting NONE from the **Change Soft Error Logging** panel.
- While this logging is in effect, the LAN Manager does not log soft error messages for the LAN segment. This does not affect the logging of soft error alerts.

DFIPD012 I Limited soft error logging enabled

Meaning: Limited soft error logging has been started for this LAN segment by selecting that option from the **Change Soft Error** panel. In addition to soft error alerts, the LAN Manager logs messages DFIPD102 and DFIPD103 (ring errors increasing/decreasing) for soft errors on this LAN segment while limited soft error logging is in effect. Limited soft error logging stays in effect until the soft error logging option is changed from the **Change Soft Error** panel or the LAN Manager is reset or reinitialized.

DFIPD014 I Error counters reset

Meaning: Reset soft error logging was chosen for this LAN segment from the **Change Soft Error Logging** panel. The LAN Manager cleared the error counters and changed the soft error logging mode to NONE. While this option is in effect, the LAN Manager does not log soft error messages for this LAN segment. This does not affect the logging of soft error alerts.

If the LAN segment is the LAN Manager's LAN segment and the LAN segment status was Soft Error when this message was displayed, the LAN segment status changed to Normal. If the soft error has not been resolved, the status returns to Soft Error within six minutes.

DFIPD030 W Data loss started

Meaning: The LAN Manager has minimum buffer space available. It is no longer logging messages for full soft error logging or configuration changes. Message DFIPD032 precedes this message.

DFIPD031 I Data loss stopped

Meaning: The LAN Manager has resumed logging messages for full soft error logging and configuration changes.

DFIPD032 W All logging options stopped

Meaning: The LAN Manager has minimum buffer space available. It is no longer logging messages for full soft error logging and configuration changes. It continues to log soft error alerts.

- DFIPD033 I All logging options started**
Meaning: The LAN Manager has regained buffer space and has resumed logging messages for full soft error logging and configuration changes.
- DFIPD049 I LAN Manager ended**
Meaning: Shutdown or Reset was selected from the LAN Manager Functions panel, causing the LAN management functions to end.
- DFIPD050 E OS/2 level incorrect. Press Enter key to exit.**
Meaning: You are using a level of OS/2 that is not supported by the LAN Manager. You should use OS/2 Extended Edition, Version 1.1.
- DFIPD054 I LAN Manager already loaded. Press Enter key to exit.**
Meaning: The LAN Manager is already running on this station in another OS/2 session.
- DFIPD083 E File full, operation failed**
Meaning: All available space on the target file has been used. No data can be added.
- DFIPD084 E Return code = *nn* while accessing file *filename.ext***
Meaning: A disk error occurred while trying to access a disk file (the event log, alerts file, bridge definition file, adapter definition file, or system file) in one of these requests:
- Create an event log report
 - Display the alerts
 - Access a bridge definition
 - Run a path test. (The path test looks at the bridge definition file and the adapter definition file).
- DFIPD085 E Error accessing file, *filename.ext***
Meaning: This message is displayed if a disk I/O error is encountered during initialization. The file which caused the error is identified by *filename.ext*. After this message is displayed, the product will be shut down when the operator presses the Enter key.
- If the named file is any of the following, you should erase the file and try again to start the LAN Manager:

DFIALDET.LOG
DFIEVENT.LOG
DFIERROR.LOG
DFIADEFS.DAT
DFIBDEFS.DAT

Otherwise, the named file is a file shipped with the LAN Manager. In that case,

1. Erase the file from your fixed disk.
2. Restore the file one of the LAN Manager diskettes.
3. Restart the LAN Manager.

DFIPD086 I **Old alerts have been overlaid by new alerts. Press F5 to refresh.**

Meaning: While you were looking at the list of alerts, new alerts arrived and overlaid the oldest alerts in the list. (This is the "wrap" condition that the alert details file experiences when it has filled up.) This message is also displayed when you try to scroll the list or look at one of the alerts that was overlaid.

Press F5 to refresh the list or press F3 or Esc to exit.

DFIPD101 E **Ring error limit exceeded**

Meaning: The number of soft errors in the identified fault domain has exceeded the allowable limit. This may cause a noticeable decrease in the LAN segment's performance. The First Adapter, if shown, is the upstream adapter. This message is also an alert.

Action: Record the LAN segment status, LAN segment, and the one or two adapter addresses given.

1. Go to the **Soft Error Conditions** panel and select the LAN segment with the failing adapters. You may need to attempt this operation more than once before the LAN Manager is able to respond because the LAN segment is experiencing soft errors.
2. If no adapter addresses are flagged with asterisks (*), press F5 (Refresh) to refresh the panel. If there are still no addresses with asterisks after several refreshes, contact your network administrator.
3. Record the address of each adapter (and its NAUNs) that has one or two asterisks. To find the adapter names, use the **Adapter Profile** function.

4. Starting with the first adapter on the list with one or two asterisks, remove all flagged adapters on the LAN segment.

Notes:

- a. Be aware of the impact of removing servers, bridges, gateways, or other critical resources.
- b. Removing an adapter may change the fault domain. The problem is in the original fault domain shown in the data section of the message.

5. After removing all the flagged adapters, check the LAN segment status. It should change to Normal within a minute.

Note: It may take 20-30 seconds after the status has returned to **Normal** for the adapters to be removed from the table. For the LAN Manager's LAN segment, refresh the panel to see which adapters remain in the table.

If the status does not change to **Normal**, return the removed adapters to the LAN segment (by restarting the application program they were running) and go to the *IBM Token-Ring Network Problem Determination Guide*.

If the status changes to **Normal** and then returns to **Soft Error** within six minutes, return the removed adapters to the LAN segment (by restarting the application programs they were running) and go to the *IBM Token-Ring Network Problem Determination Guide*.

If the status changes to **Normal** and remains **Normal** for at least six minutes, continue with the next step.

6. Using the addresses recorded in step 3 on page A-7, return one of the removed adapters to the LAN segment (by restarting the application program it was running).
7. Observe the LAN segment status indication.

If the status changes to **Soft Error** within six minutes, record the address of the adapter you most recently returned to the LAN segment. Remove it from the LAN segment. Go to step 8.

If the LAN segment remains **Normal** for at least six minutes, continue with the next step.

8. If all of the removed adapters (except adapters recorded in step 7) have been returned to the LAN segment, go to step 9 on page A-9. Otherwise, return the next adapter to the LAN segment and go to step 7.

9. If any adapter addresses were recorded in step 7, go to the *IBM Token-Ring Network Problem Determination Guide* using a symptom of "Soft Errors on a Lobe."

If no addresses were recorded in step 7 on page A-8, the problems are resolved. No further actions are required.

DFIPD102 W Ring errors increasing

Meaning: Adapters on the LAN segment are detecting soft errors and the number is approaching an unacceptable level. You see this message only when full soft error logging is in effect.

The First Adapter, is shown, is the upstream adapter. Its address establishes the fault domain.

DFIPD103 I Ring errors decreasing

Meaning: The rate of soft errors is decreasing. The source of the soft errors may have been removed.

The First Adapter, if shown, is the upstream adapter. Its address establishes the fault domain.

DFIPD104 W Recovered error counters

Meaning: The number of non-isolating errors has exceeded the reporting limit for one or more of the eight counters shown. The source is unknown. This message can occur during normal operation since adapter insertions are considered non-isolating errors. You see this message only when full soft error logging is in effect.

DFIPD106 I Ring error report

Meaning: A soft error has been detected. This message can be expected as a normal function of the LAN segment. You see this message only when you have selected full or limited soft error logging from the **Change Soft Error Logging** panel.

DFIPD107 E Adapter congested

Meaning: More traffic has been sent to an adapter than the adapter could handle. As a result, an excessive number of frames could not be received by the adapter. This message is an alert.

Action: If the problem occurs regularly over a period of time, particularly when the same tasks are repeated, examine the network configuration.

- If the adapter is at a server, such as a file server:
 - Reroute some of the traffic to a different server if possible
 - or
 - Stop some of the traffic temporarily to distribute the traffic flow more evenly.
- If the adapter is a bridge adapter:
 - Consider adding another bridge connecting the same two LAN segments.
 - Consider reducing traffic through the bridge by moving servers to the LAN segment from which the heavy traffic originates.

If the problem is persistent, the adapter may have a hardware or software problem. Run the diagnostics for your adapter; the diagnostics are described on page A-2.

DFIPD108 W Ring poll failure

Meaning: The ring poll process has encountered an error and recovery has taken place. You see this message only when you have selected full soft error logging for that LAN segment from the **Change Soft Error Logging** panel.

DFIPD109 W Ring monitor error - ring recovered

Meaning: The LAN segment recovered after a ring monitor error occurred. You see this message only when you have selected full soft error logging for that LAN segment from the **Change Soft Error Logging** panel.

DFIPD110 I Adapter no longer congested

Meaning: This message is logged when the LAN Manager detects that an adapter that was congested is no longer congested.

DFIPD120 E Error reporter failed, processing continues

Meaning: The error reporter function of the LAN Manager has failed and the LAN Manager is continuing to process other information. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Action:

1. Select the reset option from the **Change Soft Error Logging** panel for the local LAN segment. If this message recurs, continue with step 2. Otherwise, you may stop here.
2. Reset the LAN Manager (from the **LAN Manager Functions** panel).
3. If the message continues to be displayed, shut down and restart the LAN Manager or run the diagnostics for your adapter (described on page A-2).
4. If the message continues to be displayed, reinstall the LAN Manager on the fixed disk.
5. If the problem persists, record the data section of the message and contact the service supplier defined in "Statement of Service" on page C-6.

DFIPD123 E Monitored adapter is not on network

Meaning: The LAN Manager did not receive a response from an adapter that is being monitored. This message is also an alert. Possible causes of this message are:

- The computer at that station may have been turned off
- The adapter may have been removed by the LAN Manager
- The adapter may have experienced a beaconing condition, a continuous-carrier condition, or a no-carrier condition and removed itself from the network
- The monitored adapter may be on a LAN segment that the LAN Manager no longer manages
- The LAN Manager could not make initial contact with the adapter when it attempted to monitor the adapter
- The LAN Manager's adapter may be congested and unable to receive the frames reporting the presence of the monitored adapter.

If the problem was a continuous carrier, no carrier, or a beacon, you will also see other messages and alerts related to the error condition.

If the LAN Manager's adapter was congested, message DFIPD107 was logged in the same time frame as this message.

Action: Determine if the LAN Manager's adapter was congested, or why the monitored adapter was removed from the network or why it did not respond to the LAN Manager's query. Refer to the alerts log or to other messages in the event log for any messages or alerts related to problems with the adapter. Contact the end user of the monitored adapter for information about any events that might indicate problems with the adapter.

- If the adapter was not removed, and the LAN Manager's adapter was congested (message DFIPD107 was logged), follow the instructions in DFIPD107.
- If the monitored adapter is on a LAN segment no longer managed by the LAN Manager, either restore the communication link to the LAN segment or change the adapter definition to stop monitoring the adapter.
- If the adapter was purposefully removed from the network, determine the reason:
 - If the removal was due to a "Remove adapter" command, resolve the condition that required the adapter to be removed and restart the adapter.
 - If the resource is no longer needed, change the adapter definition to stop monitoring.
- If the adapter was removed as a result of an error condition, resolve the error condition:
 - Continuous-carrier, no carrier, or beaconing condition: refer to the IBM PC Network Hardware Maintenance and Service manual or the IBM Token-Ring Problem Determination Guide, as appropriate.
 - Adapter hardware or software error: resolve the problem and restart the station.
 - Computer power off: turn the power back on and restart the station.
 - Computer problem: perform computer diagnostics as instructed in the user's guide that was shipped with the computer.

- DFIPD124 I Monitored adapter returned to network**
- Meaning:** An adapter that was selected to be monitored for activity is now active on the network. This message may appear after the action for message DFIPD123 has been taken.
- DFIPD125 W No monitored adapters have been defined.**
- Meaning:** A list of only the adapter definitions of monitored adapters has been requested, and there were no adapters defined as monitored adapters.
- DFIPD126 E Maximum number of monitored adapters have been defined.**
- Meaning:** The number of adapters defined as monitored adapters has reached the maximum number allowed (1000) The adapter definition can be saved by setting monitor status to "No."
- If there are adapter definitions with monitoring set to "Yes" for addresses that are not critical, change the definition to no longer monitor the address. If there is another LAN Manager in the network, monitor the address from this LAN Manager.
- DFIPD140 I Only adapter on ring**
- Meaning:** The LAN Manager detects that this is the only active adapter on the LAN segment.
- DFIPD141 I Additional adapter(s) on ring**
- Meaning:** The LAN Manager detects that at least one other adapter on the LAN segment has become active.
- DFIPD154 I Requested function not available**
- Meaning:** You see this message when you have attempted to perform a function from the LAN Manager Functions panel and the LAN Manager's adapter is closed. The function is not available at the time of the request. (For example, a reset command received from the host is being processed.)
- The LAN Manager is not able to load the appropriate file or files from the diskette or fixed disk.
- DFIPD155 E Cursor must be on a line with data**
- Meaning:** The cursor needs to be positioned on a line with data for the operation to be performed.

- DFIPD156 I** **No adapters have been defined**
Meaning: You see this message if you choose the List Adapter Definitions function and no adapter definitions have been defined yet.
- DFIPD162 E** **Press Enter to process action**
Meaning: You typed an action on the panel then pressed a key other than Enter (such as an F-key or a scroll key).
- DFIPD163 E** **Request only one action**
Meaning: You typed an action next to more than one item on the panel, then pressed Enter. Only one action is allowed on only one item at a time.
- DFIPD164 E** **Invalid action requested. Please try again.**
Meaning: You typed an action that is not available on this panel, then pressed Enter.
- DFIPD165 E** **Only one type of action allowed**
Meaning: You typed more than one kind of action code on the panel, then pressed Enter. Only one kind of action at a time can be specified.
- DFIPD174 E** **Bridge is linked. Deletion not permitted**
Meaning: You tried to delete a bridge definition but that bridge currently has a communication link established with the LAN Manager. A bridge must be defined to the LAN Manager in order for the LAN Manager to communicate with it. The definition may be deleted after the communication link is terminated.
- DFIPD176 I** **Adapter address not unique**
Meaning: The same adapter address was entered for both adapters in the Bridge Definition function, or the adapter address indicated by the cursor is the same as an adapter address in another bridge definition. Bridge adapter addresses defined to the LAN Manager must always be unique addresses. The adapter address was probably mis-typed.

DFIPD177 I LAN segment number not unique

Meaning: The same LAN segment number was entered for both adapters in the Bridge Definition function. The adapters in a bridge are always on different LAN segments.

DFIPD178 I Bridge definition added

Meaning: A new bridge definition was successfully added.

DFIPD179 I Bridge definition changed

Meaning: The bridge definition was successfully changed.

DFIPD180 E Bridge link failure.

Meaning: The communication link between the LAN Manager and the bridge has been lost. The failure could be due to a problem in the bridge, a problem with the link between two remote bridge stations, a problem in the LAN Manager, or to interference on the LAN Manager link. For example, the bridge may have been turned off or a LAN segment on the path between the bridge and the LAN Manager may be beaconing. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Action:

1. Try to reestablish the link using the "Link Bridge" portion of **Bridge Functions**.
2. If the link is not reestablished:
 - a. Follow the instructions for any error messages you may receive during this procedure.
 - b. Check the alert log to see if there are any alerts for any LAN segments in the path to that bridge. If any LAN segments in the path are experiencing problems, follow the instructions in this appendix for those alerts. If necessary, go to the *IBM Token-Ring Network Problem Determination Guide* or the *IBM PC Network Hardware Maintenance and Service Guide* to perform problem determination on any LAN segment that is not operating normally.

If the link failure problem is persistent:

1. Check that the bridge is powered on.
2. Start the bridge program again.
3. Perform a bridge self-test.

4. Check that the other bridges in the path between this bridge and the LAN Manager are functioning.
5. If restart on error was specified in the Bridge Program's configuration:
 - a. Stop the Bridge Program.
 - b. Check the bridge's error log to see if there was a bridge failure at the time the link was lost. See the Bridge Program *User's Guide* for any actions to take.

DFIPD182 W Security Breach - unauthorized manager

Meaning: A non-controlling (observing) LAN manager is attempting to change some parameters, such as single-route broadcast, in a bridge. Only a controlling LAN manager can perform that function.

DFIPD183 E LAN Manager rejected by bridge

Meaning: Another LAN Manager tried to link with the bridge but was rejected for one of the following reasons:

- The other LAN Manager used the wrong password for the reporting link. This is a possible security concern.
- The link is already in use by another LAN Manager.

When the reason for rejection is an invalid password, this message is an alert.

Action: Working with your network administrator, investigate the circumstances. The LAN Manager that attempted the link is identified in the alert. A link failure message in its event log (for the same date and time as this message) identifies the bridge and the reason for the link failure. If that LAN Manager is authorized to link to that bridge:

- Check that the password was entered correctly when the reporting link was defined at that LAN Manager.
- Check that the password is current in the reporting link definition at that LAN Manager.
- Check that the link being requested is not already in use.

DFIPD186 W Bridge parameters have been changed

Meaning: A bridge parameter, such as single-route broadcast or hop count, was changed by a LAN Manager or by the bridge itself.

DFIPD187 E Bridge performance threshold exceeded

Meaning: An excessive number of frames trying to pass from one bridge adapter to the other have been discarded. This may be due to any of the following:

- Heavy traffic at the bridge
- A bridge performance threshold value that is too low
- An excessive number of invalid frames reaching the bridge
- A problem with the target adapter or target LAN segment (continuous carrier or beaconing, for instance)
- In a Token-Ring Network Bridge Program Version 2.1, operating as a remote bridge: problems in the telecommunications link between the two bridge computers.

The event log provides additional data.

This message is also an alert.

Action:

- If you suspect a problem on the target LAN segment, perform problem determination on the affected LAN segment using the IBM Token-Ring Network Problem Determination Guide or the IBM PC Network Hardware Maintenance and Service Guide, as appropriate.
- If the problem seems to be heavy traffic (adapter congestion), examine the network configuration for ways to reduce the traffic flow through this bridge.
 - Consider adding another bridge connecting the same two LAN segments.
 - Consider reducing traffic through the bridge by moving servers to the LAN segment from which the heavy traffic originates.
 - Consider re-routing some traffic through other bridges.
- If the problem is heavy traffic and you do not want to change the network configuration, consider raising the bridge performance threshold value. Adjust the value over time to achieve a better correlation between occur-

rences of the threshold being exceeded and end-user perception of response time problems.

See the appropriate Bridge Program User's Guide or the *IBM Local Area Network Administrator's Guide* for instructions.

- If the problem might have some other cause (such as invalid frames) and if you have a trace tool, such as the IBM Token-Ring Network Trace and Performance Program, trace the frames on the LAN segment.
- If the bridge uses the IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge and the problem seems to be an error with the telecommunications link between the bridge stations, perform problem determination on the bridge using the procedures in the bridge's User's Guide. This error is indicated when the "Frames not forwarded: telecommunications link error" counter contains a non-zero value.

Refer to the *IBM Local Area Network Administrator's Guide* for details about the counter.

DFIPD188 E Bridge congested

Meaning: Management data directed to or from the bridge has been discarded because of insufficient buffers at the bridge to handle the communications.

Management data includes error reports, beaconing reports, requests for performance counters, and other kinds of reporting; it does not include frames being forwarded *through* the bridge.

The problem may be that traffic forwarded through the bridge is so heavy that management data cannot be processed, or the LAN Manager buffers may be full. This message is an alert.

Action:

1. Check the LAN Manager's LAN segment status or the alert log for possible soft error conditions on the LAN Manager's LAN segment. If the LAN segment is experiencing soft errors, perform problem determination on the LAN Manager's LAN segment using the *IBM Token-Ring Network Problem Determination Guide* or the *PC Network Hardware Maintenance and Service*, as appropriate.

2. If the LAN Manager's LAN segment status shows **Data Lost** the LAN Manager's buffers are full. Try to reduce the traffic coming to the LAN Manager:
 - a. Check the LAN Manager "soft error logging" options for the LAN Manager's LAN segment. If the soft error logging option is set to "Full," temporarily set it to "Limited" or "None."
 - b. Check the "log configuration changes" option. If the configuration changes logging option is set to "All," temporarily set it to a single LAN segment or to "None."
3. Do the bridge performance calculations that are outlined in the *IBM Local Area Network Administrator's Guide*. If the calculations show that the bridge is too busy, reduce the bridge traffic. These options are available:
 - Consider adding another bridge connecting the same two LAN segments.
 - Consider reducing traffic through the bridge by moving servers to the LAN segment from which the heavy traffic originates.
 - Consider routing some traffic through other bridges.

DFIPD190 W Invalid message length

Meaning: The length of a message received by the LAN Manager is incorrect.

DFIPD191 W Duplicate data in message

Meaning: Duplicate data is detected in a message received by the LAN Manager.

DFIPD192 W Missing data in message

Meaning: Required data is missing in a message received by the LAN Manager.

DFIPD193 W Frame error

Meaning: A frame may not have been constructed properly (it does not conform to the published frame architecture), and a frame error occurred while performing the requested function. This error can occur if the target station does not recognize the command (because of an earlier version of software in the station) or cannot process the command (because of an internal error).

DFIPD202 E Error occurred: Ring recovery failed

Meaning: The ring is unable to recover automatically from a beaconing condition. When this message is logged, the LAN segment status is **Beaconing**. This message is an alert.

Action: Manual recovery is required. Record the LAN segment status and the data that is displayed with this message.

If you came from the problem determination procedures in the *IBM Token-Ring Network Problem Determination Guide*, return to the step that sent you here. If you did not, go to Chapter 2 of the *Problem Determination Guide*, "Preparing for Problem Determination."

DFIPD203 E Error occurred: Ring recovered

Meaning: The LAN segment had a beaconing error, has recovered, and is operating normally. No adapter has been removed. When this message is logged, the LAN segment status is **Normal** or **Soft Error**. This message is an alert.

Action: If you came from the problem determination procedures in the *IBM Token-Ring Network Problem Determination Guide*, record the LAN segment status and the data section of the message and return to the step that sent you here. Otherwise, no action is required.

DFIPD204 E Error occurred: Ring recovered - adapter(s) removed

Meaning: The LAN segment had a beaconing error and has recovered, but one or both adapters in the fault domain have been removed (either manually or by the auto-removal process). Message DFIPD202 indicates the fault domain if auto-recovery failed. This message indicates that there may be a fault on the lobe of the station that removed itself, or on the backup path. When this message is logged, the LAN segment status is **Normal** or **Soft Error**. This message is an alert.

If this message indicates that both adapters in the fault domain were removed and it is followed immediately by message DFIPD203, it indicates that the problem may be caused by beaconing on the backup path. If the cause is beaconing on the backup path, message DFIPD327 appears in approximately six minutes.

Action: If you came from the problem determination procedures in the *IBM Token-Ring Network Problem Determination Guide*, record the LAN segment status and the data

section of the message and return to the step that sent you here. Otherwise, go to Chapter 2 of the *IBM Token-Ring Network Problem Determination Guide*, using "adapter removed" as the symptom.

DFIPD205 E Fault information changed.

Meaning: The fault domain has changed as a result of manual intervention procedures. The ring is still beaconing.

DFIPD206 E Manual intervention complete: Ring recovered

Meaning: The ring is no longer beaconing.

DFIPD209 E Auto-removal error

Meaning: The LAN Manager has automatically removed its own adapter from the LAN segment as the result of a beaconing or continuous carrier condition. This message is an alert.

Action: If you came from the problem determination procedures in the *IBM Token-Ring Network Problem Determination Guide*, return to the step that sent you here. Otherwise, record the data section of the message and perform problem determination procedures using the *IBM Token-Ring Network Problem Determination Guide* or the *IBM PC Network Hardware Maintenance and Service Guide*, as appropriate.

DFIPD210 E Unable to initialize LAN Manager's adapter

Meaning: The LAN Manager's adapter did not respond to the LAN Manager's attempt to initialize the adapter.

DFIPD211 E Unable to open LAN Manager's adapter

Meaning: The LAN Manager's adapter did not respond to the LAN Manager's attempt to open the adapter. The adapter detected an error when the LAN Manager attempted to open it.

DFIPD212 E LAN Manager's adapter hardware failed

Meaning: The LAN Manager's adapter hardware failed, and the adapter is no longer attached to the LAN segment. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Action: Run the diagnostics for your adapter, described on

page A-2. If the diagnostics indicate that the adapter is operational and you still get this message, record the data section of the message and contact the service supplier defined in "Statement of Service" on page C-6.

DFIPD213 E LAN Manager's adapter interface failed

Meaning: The adapter interface code failed, and the LAN Manager's adapter has been removed from the LAN segment. The failure could be due to a mismatch between the adapter interface code and the adapter microcode. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Action: This procedure has several steps.

1. Reset the LAN Manager.
2. If this message is displayed again, shut down the LAN Manager and restart it.
3. If this message is displayed yet again, restart the computer.
4. If this message continues to be displayed, run the diagnostics for your adapter.
5. If the adapter is good and the message continues to be displayed, reinstall the LAN Manager on the fixed disk using the instructions in "Reinstalling the LAN Manager" on page A-3.
6. If the problem is still not corrected, record the data section of the message and contact the service supplier defined in "Statement of Service" on page C-6.

DFIPD214 E Unable to close LAN Manager's adapter

Meaning: The LAN Manager's adapter did not correctly respond to the LAN Manager's attempt to close the adapter.

DFIPD215 E LAN Manager's adapter or lobe failed

Meaning: A wire fault has caused this LAN Manager's adapter or lobe to fail. When this message is logged, the LAN segment status is **Wire Fault**. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Note: This message applies to Token-Ring Network adapters only.

Action: If you came from the problem determination procedures in the *IBM Token-Ring Network Problem Determination Guide*, return to the step that sent you here. If you did not, go to Chapter 2 of the *Problem Determination Guide*, "Preparing for Problem Determination."

DFIPD216 I LAN Manager's adapter closed

Meaning: This message is logged when the LAN Manager is shut down or reset.

DFIPD217 E Adapter error; see event log for details

Meaning: The LAN Manager's adapter is experiencing a problem during initialization.

DFIPD218 E Ring not working - unable to open adapter

Meaning: The ring is beaconing while this adapter is trying to become active. The adapter could not open.

DFIPD219 E Adapter not found. Limited function available

Meaning: The LAN Manager cannot find its own adapter or its adapter code. This is an initialization error.

Action:

1. Select the **Adapter Number** panel from **System Definition** to determine which adapter (0 or 1) is being used by the LAN Manager.

If the switch on the adapter card does not correspond to the adapter number, change the adapter number and reset the LAN Manager.

Note: Some adapters do have switches. For such an adapter, you make the primary-alternate selection through a configuration program that is shipped on diskette with the adapter.

If the adapter number is correct, make sure you have loaded OS/2 EE Version 1.1 and have configured the Communications Manager for LAN communications (IBM Token-Ring Network or IBM PC Network).

2. If the problem persists, reinstall the LAN Manager. See "Reinstalling the LAN Manager" on page 4-17.

DFIPD220 I NAUN change

Meaning: An adapter has joined or left the ring. The reporting adapter is reporting a new neighbor (NAUN means Nearest Active Upstream Neighbor). You see this message because configuration logging is in effect.

DFIPD221 I Adapter insertion

Meaning: You see this message if you have chosen to log configuration changes for the PC Network LAN segment where an adapter has inserted. An adapter has opened on the network that was not on the network before. This message is also logged for Token-Ring Network LAN segments that have linked bridges connected to the LAN segment.

DFIPD222 E Adapter removed

Meaning: The LAN Manager's adapter has been removed from the LAN segment as a result of a command from another LAN Manager or a user to remove this adapter. This message is an alert. If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host.

Action: Consult your network administrator. Wait at least six minutes before you try again to become active on the LAN segment.

DFIPD223 E Duplicate adapter addresses

Meaning: When more than one adapter is found with the same address this message is displayed. This occurs when a user queries an adapter address on all LAN segments and the adapter is found on more than one LAN segment. The numbers of the LAN segments where it was found are displayed.

DFIPD224 I New ring monitor

Meaning: A new ring monitor has become active on the Token-Ring LAN segment. You see this message only if you have selected full soft error logging for that LAN segment from the **Change Soft Error Logging** panel.

DFIPD225 I Adapter removed by LAN Manager

Meaning: You have logically removed an adapter using the LAN Manager.

- DFIPD226 W Adapter inoperative; press Esc or F3 to exit**
Meaning: You see this message when the LAN Manager's adapter closes and you are using any of the LAN Manager functions that require communication on the LAN segment.
- DFIPD227 W Adapter inoperative; function not available**
Meaning: This message is displayed when a LAN Manager function that requires communications on the LAN is requested and the LAN Manager's adapter has closed.
- DFIPD228 W Adapter inoperative; press Esc**
Meaning: You see this message when the LAN Manager's adapter has closed.
- DFIPD229 I Request cancelled**
Meaning: The operator cancelled the function.
- DFIPD230 E Unable to open LAN Manager's adapter**
Meaning: The adapter support interface code did not accept the open command from the LAN Manager.
- DFIPD231 E Unable to close LAN Manager's adapter**
Meaning: The adapter support interface code did not accept the close command from the LAN Manager.
- DFIPD232 W Unable to confirm adapter removal**
Meaning: This is displayed on the **Confirm Adapter Removal** panel. The LAN Manager has sent a frame to remove the specified remote adapter. The LAN Manager then queried the adapter to verify the removal but the bridge did not respond within a fixed period of time. This may be due to a problem in the path between the LAN Manager and the bridge.
- DFIPD233 I Adapter not found, specify LAN segment for adapter removal**
Meaning: This is displayed on the **Request Adapter Removal** panel. The operator specified an adapter number but no LAN segment number. The LAN Manager did not find the adapter on any of the active LAN segments. It may not be active or it may be congested. If the operator specifies the LAN segment number, the LAN Manager can remove a Token-Ring Network adapter even if it is congested.

- DFIPD234 I** **Information not available from adapter at this time.**
Meaning: The Manager Profile function has been requested and the information cannot be obtained from the adapter.
- DFIPD236 E** **Adapter transmit buffer must be at least 344 bytes**
Meaning: The LAN Manager cannot open the adapter because the transmit buffer size is not at least 344 bytes. The operator should increase the buffer size by reconfiguring OS/2 EE.
- DFIPD237 E** **Insufficient resource to open Service Access Point**
Meaning: The LAN Manager cannot open the Service Access Point because of insufficient resources assigned. The operator should reconfigure OS/2 EE to increase the number of Service Access Points and links defined.
- DFIPD240 E** **Invalid adapter address**
Meaning: The adapter address entered is either a functional address or a group address, or is not a full 12-digit hexadecimal address. If you entered more than one adapter address on the panel, the cursor is positioned under the address in error.
- DFIPD241 E** **Adapter name not found**
Meaning: You see this message if you have specified an adapter name that is not in the adapter definition file. You may have misspelled the adapter name. If you entered more than one adapter name on the panel, the cursor is positioned under the name in error.
- DFIPD242 E** **Adapter address not found**
Meaning: The adapter address you entered has not been assigned a adapter name. If you entered more than one adapter address on the panel, the cursor is positioned under the address in error.
- DFIPD243 E** **Name and address cannot be changed simultaneously**
Meaning: You tried to change an adapter name and its address at the same time. You can change the name assigned to the existing adapter address.

DFIPD244 E Invalid adapter name

Meaning: An adapter name was not valid. An adapter name consists of 1 to 16 alphanumeric characters, @, #, \$, and %. The name can contain any combination of letters and numbers, with one exception. It may not contain exactly 12 characters, with a combination of numbers and the letters A to F. This restriction is necessary to prevent confusion with the hexadecimal adapter address.

DFIPD245 E This adapter name already exists

Meaning: The adapter name is already assigned to another adapter address.

DFIPD246 E This adapter already has a name

Meaning: An adapter name has already been assigned to the adapter.

DFIPD247 E Adapter not found

Meaning: The adapter with the address or adapter name entered is not active on the specified LAN segment at the time of request. If no LAN segment was specified, the adapter is not active in the network.

If you specified more than one adapter on the panel, the cursor is positioned under the adapter that was not found.

DFIPD248 E Source and target adapters must be different

Meaning: On the Request Path Test panel, you have entered identical addresses or names for the source and target adapters.

DFIPD249 E Adapter not found in configuration list

Meaning: You tried to find an adapter in the LAN Segment Configuration List but the adapter name or adapter address you specified is not in the list.

DFIPD250 E Invalid request, not controlling LAN Manager

Meaning: You have selected a function that only a controlling LAN Manager can perform, such as removing an adapter, and the LAN Manager is not a controlling LAN Manager.

- DFIPD251 E Invalid LAN segment number**
Meaning: You entered a LAN segment number which is not three hexadecimal digits. This message is displayed with no additional data.
- DFIPD252 E LAN segment not found**
Meaning: You entered a LAN segment number that is not the local LAN segment and that does not have a bridge in session with the LAN Manager.
- DFIPD253 E Invalid bridge name**
Meaning: The bridge name entered in a bridge definition, bridge function, or path test was not proper alphanumeric data. A bridge name consists of 1-8 characters in almost any combination of the letters A-Z (a-z counts as A-Z), the numbers 0-9, and the characters @,\$,%,#. The character string "UNKNOWN" is not a valid bridge name.
- DFIPD254 E Bridge name not found**
Meaning: The bridge name entered has not been defined to the LAN Manager. The name may have been mistyped.
- DFIPD255 E Duplicate bridge name**
Meaning: A bridge has already been defined using this bridge name.
- DFIPD256 E Unable to communicate with specified LAN segment**
Meaning: The LAN Manager is unable to communicate with the LAN segment identified by the cursor. The specified LAN segment is experiencing errors (such as beaconing or continuous carrier).
- DFIPD257 W No bridges have been defined**
Meaning: You selected a bridge function but no bridges have been defined to the LAN Manager.
- DFIPD258 E Invalid path specified**
Meaning: The path specified has one of the following problems:
- The path specified has the same source and target LAN segment number.
 - The LAN segment numbers are not all unique.

- The described path does not connect the source and target adapters.
- At least one of the LAN segments in the specified path is a bus.

DFIPD259 E LAN Segment Configuration List is not complete

Meaning: The LAN Manager was not able to build the complete configuration list due to a condition on the network, such as a beaconing ring, which prohibited the LAN Manager from communicating with all adapters. The partial list is displayed.

DFIPD260 E Incorrect password entered. Please try again

Meaning: You have entered the wrong password.

DFIPD261 E Password attempts exceeded, press F3 to exit

Meaning: The password has been incorrectly entered three times.

DFIPD262 E Invalid data. Please try again

Meaning: The data entered is not valid for the input field on the current panel.

DFIPD263 E Required data is missing. Please try again

Meaning: The data that is required to perform an operation is missing.

DFIPD264 I Data not deleted

Meaning: Either you have not confirmed a deletion or a problem with the LAN Manager causes you to be unable to delete an item (such as an alert or a adapter definition) or to erase the event log.

DFIPD265 I No records found

Meaning: No data exists in the event log that meets the conditions (such as time and date range) you specified when you requested the report.

- DFIPD266 I Function not valid for this LAN type**
- Meaning:** A function that is not available for all LAN segment types was attempted using a LAN segment number that is not a valid type for the selected function. Select the **Network Status** panel from **Network Functions** to view the LAN segment types.
- DFIPD272 I Old password is incorrect. Please try again**
- Meaning:** The old password entered does not match the current password. If the Security function is not active, the "Old password" field should be left blank on the **Change Operator Password** panel.
- DFIPD273 I Password format is incorrect. Please try again**
- Meaning:** The new passwords must be 6 to 8 characters long with no imbedded blanks. The valid characters are: letters "A" to "Z" and "a" to "z," numbers "0" to "9," and special characters @, \$, %, and #.
- DFIPD274 I New passwords do not match. Please try again**
- Meaning:** The two new password fields must match. The first new password is valid. The second does not match the first.
- DFIPD275 I No adapters have accumulated error counts**
- Meaning:** No adapters have accumulated enough soft errors to be reported at this time. The **Soft Error Conditions** panel will not contain any adapters.
- DFIPD276 A password has not been defined**
- Meaning:** You have selected **Secure system** but did not have a password defined (see "Security (Setting the Password)" on page 3-5.)
- DFIPD280 I Operation failed - No communication response received**
- Meaning:** The LAN Manager sent a frame to a station which did not respond within a fixed time. Check the status. If the status is **Normal**, retry the operation.

- DFIPD281 I Adapter present but not responding**
Meaning: The destination adapter is on the LAN segment, but is not responding to LAN Manager queries. The adapter may be congested.
- DFIPD282 I Operation failed - link busy**
Meaning: The bridge used to process the command is too busy to respond to the LAN Manager.
- DFIPD283 I Errors/warnings detected - see event log**
Meaning: The LAN Manager failed to automatically establish a communication link with one or more bridges during initialization or reset, or a host communication error occurred.
- DFIPD284 I Operation failed -- Out of resources**
Meaning: The operation cannot be completed because all the LAN Manager's buffers are in use at the time of the request.
- DFIPD285 I Bridge already linked**
Meaning: You tried to link to a bridge that already has the communication link established. The communication link is not disrupted.
- DFIPD286 I Bridge already unlinked**
Meaning: You tried to take down the link to a bridge that does not have a communication link established.
- DFIPD287 E Bridge already defined**
Meaning: The bridge number and LAN segment numbers you specified in the Define Bridge function have been used in another bridge definition.
- DFIPD288 I Last bridge must be linked for path test**
Meaning: The last bridge in the specified path is not in session with the LAN Manager.

DFIPD289 I Operation failed - bridge not linked

Meaning: You requested a bridge function (bridge profile, for instance) but the LAN Manager does not have a communication link established with that bridge. Possibly the bridge name is undefined or was typed incorrectly.

DFIPD298 I Ring *nnn* already set to full soft error logging

Meaning: You tried to set a ring to Full Error reporting mode but the ring identified in the message is already in Full Error reporting mode. Only one ring at a time can be in Full Error reporting mode in the network.

DFIPD300 E Bridge failed to link RC = *nn*

Meaning: The bridge failed to link on operator request (Link Bridge function) or during LAN Manager initialization. This message is displayed with a reason code (*nnn*) that identifies the cause of the failure:

- 001 One or both LAN segment numbers or the bridge number in the LAN Manager bridge definition is incorrect.
- 002 One of the adapter addresses in the LAN Manager bridge definition is incorrect.
- 003 The reporting link password is incorrect.
- 004 Another LAN Manager is already linked to the bridge with the reporting link that you are requesting.
- 005 One or both of the adapter addresses in the bridge definition are incorrect, or the bridge took too long to respond.
- 006 No data link buffers are available to set up the link.
- 007 The Bridge Program rejected the LAN Manager for a reason other than wrong password or the link already in use.

Try again. If you still cannot establish the link, the bridge is not compatible with the LAN Manager.
- 008 The bridge table is full. The maximum number of bridge links (64) are already linked.

- 009 The segment table is full. This condition occurs when your linking sequence contains more than 65 LAN segments that do not already have other bridges linked to the LAN Manager
- 010-014 The bridge detected an error in a LAN Manager frame, or the LAN Manager received an invalid response from the bridge. The bridge is not a supported bridge, the bridge is faulty, or there is an error in the LAN Manager.
- Make sure the Bridge Program is one of the following:
- IBM Token-Ring Network Bridge Program Version 1.1, Version 2.0, or Version 2.1
 - IBM PC Network Bridge Program, Version 1.0.
- If the bridge uses one of these, either the Bridge Program or the LAN Manager is faulty. Contact your service supplier defined in "Statement of Service" on page C-6.
- 015 There are no more link stations available to link to the bridge (defined in the Communications Manager configuration file).
- 099 Some error other than those listed above occurred.

DFIPD301 I Bridge number conflict in bridge definition

Meaning: The LAN Manager did not establish the link to the bridge, because the bridge number in the LAN Manager bridge definition does not match the bridge number in the Bridge Program configuration.

DFIPD302 W Segment number conflict in bridge definition

Meaning: The LAN Manager did not establish the link to the bridge, because a LAN segment in the LAN Manager bridge definition does not match the LAN segment in the Bridge Program configuration.

DFIPD306 W Bridge shut down

Meaning: The Bridge Program has ended before the communication link with the LAN Manager has been shut down. The return code identifies the reason the Bridge Program ended. The bridge cannot be used to communicate with the LAN segment on the other side of the bridge until the Bridge Program is restarted. This message is also an alert.

Action: Use the return code to determine what caused the Bridge Program to end. For continued bridge operation:

1. Correct the problem, if any, using the procedures in the documentation provided with the bridge hardware and software.
2. Restart the bridge and reestablish the communication link with the LAN Manager.

DFIPD307 I Link limit exceeded

Meaning: This message is displayed when the operator tries to add a 65th bridge definition that specifies automatic linking to the LAN Manager ("Link during bringup" = Y). The maximum number of bridges that can be in session with the LAN Manager at one time is 64.

DFIPD310 I Adapter definition added

Meaning: An adapter name, monitoring flag, and comment were successfully added to the adapter definition file.

DFIPD311 I Adapter definition changed

Meaning: An adapter name, monitoring flag, or comment was successfully changed in the adapter definition file.

DFIPD312 I No changes made

Meaning: You used F3 (Quit) or Esc to exit from a panel on which data changes are made. If you typed any data it was not saved, and no changes were made in the files.

DFIPD313 I Adapter number changed

Meaning: The new adapter number will be in effect at the next initialization or reset of the LAN Manager.

DFIPD314 I Reporting link data changed.
Meaning: The reporting link, or reporting link password, or both has changed. The change will take effect when you reinitialize or reset the LAN Manager.

DFIPD320 I LAN name changed
Meaning: The new LAN Name will be in effect at the next initialization or reset of the LAN Manager.

DFIPD321 I Trace option changed
Meaning: The option that allows tracing on the LAN segment has been changed. The trace password has been changed or removed, or the list of allowable trace adapters has been changed.

DFIPD322 I Ring trace notification
Meaning: A frame tracing tool (ring trace tool) such as the IBM Token-Ring Network Trace and Performance Program has either begun or concluded tracing activity on its LAN segment. The notification flag describes what the frame tracing tool is doing.

0000 Trace started

0001 Trace already in progress when the LAN Manager became active.

FFFF Trace ended

DFIPD323 W Unauthorized trace attempt on the LAN
Meaning: This is a possible security concern. An unauthorized frame tracing tool (ring trace tool) is present on the Token-Ring segment and has attempted to trace frames. The LAN Manager has issued a Remove command to the trace tool adapter and will do so each time the adapter attempts to trace.

Either tracing is not allowed, or the adapter is not in the list of adapters specified in the Trace Option function.

This message is also an alert.

Action: Record the name and address of the adapter that attempted to trace. Report this information to the LAN administrator.

Together with your LAN administrator, determine whether to add the adapter to the list of adapters authorized to trace, and whether any tracing should be permitted.

Use the **Trace Option** at a controlling LAN Manager to prohibit all trace activity, or to identify which IBM Token-Ring Network Trace and Performance adapters on the network are permitted to trace frames.

DFIPD324 I Host connection option changed

Meaning: The new host connection option will be in effect at the next initialization or reset of the LAN Manager.

DFIPD325 E Host connection initialization failed

Meaning: The communication link between the LAN Manager and the host could not be established. The reason code identifies the cause. The return code provides data for problem determination. The file name, if shown, identifies a failing module in the dynamic link routine.

Reason Code Meaning

00	The dynamic link routine specified by the filename could not be loaded by OS/2. The return code is an OS/2 return code.
01	The NewView/PC Open SPCF request or the Open Operator Communications API request failed.
02	The OS/2 Allocate Segment request or the Allocate Shared Segment request failed.
03	The OS/2 Create Queue request failed.
04	The OS/2 Create Thread request failed.
05	The OS/2 Suballocate request failed.

DFIPD326 E Main path wrapped to backup path

Meaning: A Token-Ring cable has been disconnected on the ring, or an error was encountered, and the main ring path wrapped onto the backup path. The Token-Ring segment is now using the backup path.

You see this message only if the ring has a device on it, such as an IBM 8220 Optical Fiber Converter, that can detect wire wrap.

This message is also an alert.

Action: Refer to the *IBM Token-Ring Network Problem Determination Guide* for problem determination procedures.

DFIPD327 E Backup path inoperative

Meaning: The backup path of the ring has been in a beaconing condition for more than six minutes.

This message is also an alert.

Action: Refer to the *IBM Token-Ring Network Problem Determination Guide* for problem determination procedures.

You see this message only if the ring has a device on it, such as an IBM 8220 Optical Fiber Converter, that can detect wire wrap.

DFIPD328 I Main path wrap condition corrected

Meaning: The wrap condition of the main ring path onto the backup path has been corrected.

You see this message only if the ring has a device on it, such as an IBM 8220 Optical Fiber Converter, that can detect wire wrap.

DFIPD329 I Backup path recovered

Meaning: The backup path of the Token-Ring LAN segment has recovered from a beaconing condition.

You see this message only if the ring has a device on it, such as an IBM 8220 Optical Fiber Converter, that can detect wire wrap.

DFIPD350 I Continuous carrier: network recovered

Meaning: Either of two conditions has occurred:

- The LAN Manager has detected a **continuous carrier** condition on the LAN segment
- The LAN Manager has received a notification from another station on the LAN segment.

The network has recovered automatically. No station was removed to recover the bus.

DFIPD352 E Continuous carrier: recovery failed

Meaning: The network is unable to recover automatically from a **continuous carrier** condition on an adapter other than the LAN Manager's adapter. The problem may be that the modem on the adapter that removed itself from the network is still transmitting. When this message is logged, the LAN segment status is **Continuous carrier**. This message is an alert.

Action: Record the data that is displayed with this message, then follow the problem determination procedures in the *IBM PC Network Hardware Maintenance and Service* manual to verify that this is the failing adapter and to resolve the problem.

DFIPD353 I Network recovered from continuous carrier

Meaning: An adapter had a continuous-carrier condition and automatic recovery failed. The network has recovered, probably due to manual removal of the adapter causing the continuous-carrier condition.

DFIPD354 E Continuous carrier recovered: adapter removed

Meaning: A **continuous carrier** condition occurred on the network, and the adapter causing the condition removed itself from the network. This message is an alert.

Action: Record the data that is displayed with this message, then turn off the problem adapter's computer and replace the adapter.

DFIPD355 E Continuous carrier - source unknown

Meaning: A **continuous carrier** condition has been detected on the network, but the affected device is not able to report itself to the LAN Manager and is not able to remove itself. The LAN segment status is **Continuous carrier**. This message is an alert.

Action: To locate the adapter causing the continuous carrier, refer to the *IBM PC Network Hardware Maintenance and Service* for problem determination procedures.

DFIPD356 E No-carrier condition detected

Meaning: LAN Manager's LAN segment: A cable located between the LAN Manager and the translator unit is loose or broken. The problem could also be in the translator unit, such as a loss of power.

Remote LAN segment: The bridge cable may be loose or broken, or there may be a problem with the translator unit on that LAN segment.

This message is also an alert

Action: Check to see if the cable from the LAN Manager to the wall is loose. If not, then follow your establishment's procedure for locating and fixing the loose or broken cable or fixing the translator unit.

DFIPD357 I Network recovered from no-carrier condition

Meaning: LAN Manager's LAN segment: The network had a loose or broken cable between the LAN Manager and the translator unit, or there was a problem with the translator unit.

Remote LAN segment: There may have been a loose or broken cable at the bridge, or a problem in the translator unit on the remote LAN segment.

The cable or translator unit has been restored to operating condition in response to message DFIPD356. The network is operational.

DFIPD361 I Adapter left the network.

Meaning: An adapter on a PC Network LAN segment has left the network. This message occurred because you have chosen to log configuration changes for the LAN segment.

To stop logging this and other configuration changes, select NONE on the Change Configuration Logging panel. Otherwise, no action required.

DFIPD367 E Adapter not found on network or not responding

Meaning: You entered an address or symbolic name of an adapter that is either not present, not active in the network, or has no buffer space available to receive messages at the time of request.

DFIPD990 E xxx xxx xxx xxx xxx xxx

Meaning: (This message has no text. Error codes are shown next to the message number.) The LAN Manager is experiencing a critical internal error and is no longer operational. This message is an alert.

If the LAN Manager (controlling or observing) has communication with a host, this alert is also sent to the host. The error codes are displayed only for use by service suppliers in the event of a problem you are unable to resolve.

Action:

1. Reinstall the LAN Manager.
2. If the problem recurs, record the error codes (up to six codes). See "Statement of Service" on page C-6 to obtain LAN Manager service.

Appendix B. Table of LAN Manager Functions

Table B-1 indicates the page numbers of the instructions for each function of the LAN Manager. **LAN Manager Functions**

Table B-1 (Page 1 of 2). LAN Manager Functions		
Function	Task	Page
Alert Functions	Display information about alerts received, or delete alerts from the alerts file.	6-4
Event Log Functions	Display or print reports from the event log or delete the event log	7-1
	Specify whether to log configuration changes in the event log	7-4
	Specify the kind of soft errors to be reported	7-5
Adapter Functions	Request information about adapters	8-2
	Remove an adapter from the network	8-8
	Request information about the LAN Manager's adapter	8-9
	Specify which adapters should cause alerts if removed from the network	8-19
	Add/find/change/display/print symbolic names	8-12
Bridge Functions	Display a bridge's parameters and performance counters.	9-3
	Establish a reporting link with a bridge	9-9
	Terminate a reporting link with a bridge	9-10
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	Add/find/change/delete/display bridge definitions	9-17

Table B-1 (Page 2 of 2). LAN Manager Functions

Function	Task	Page
Network Functions	Display the status of the network	10-2
	Display or print order of active adapters on a LAN segment	10-6
	Conduct a path test	10-9
	Conduct a LAN segment test	10-10
	Display or remove adapters experiencing soft errors	10-11
System Definition	Check or change the adapter number	3-3
	Establish or change the operator password	3-5
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	Define the authorization level and reporting link password the LAN Manager will use	3-6
	Define the LAN name to use in alerts	3-9
	Specify whether to allow trace tool	3-9
Secure System	Protect the LAN Manager from unauthorized use.	11-1.
Reset	End the LAN Manager and start it again	11-2
Shutdown	End LAN management functions and return to OS/2	11-2

Appendix C. License Information

This Appendix contains License Information about the IBM LAN Manager Version 2.0, part number 25F8215. The product identifier for this program is 560122701.

STATEMENT OF LIMITED WARRANTY (MEDIA AND PROGRAM)

International Business Machines Corporation (IBM) grants the following limited warranty for this IBM Licensed Program (Program) if this copy of the Program is delivered by IBM, an IBM Authorized Dealer for this Program, or any other IBM approved supplier for this Program to a user. (Such a user is referred to herein as "original user.") A "user" shall mean a Customer who acquired possession of and is licensed to use this copy of the Program for its own use or for use within its own business enterprise and not for remarketing. Any unused portion of the Warranty Period may be conveyed to another user.

1) MEDIA

The Warranty Period for the media on which the Program is recorded is for three months from the date of its delivery to the original user as evidenced by a receipt. IBM warrants that this media will be free from defects in material and workmanship under normal use during the Warranty Period. If notified during the Warranty Period that the media contains such defects, IBM will replace such media. If IBM is unable to deliver replacement media, you may terminate your license and your money will be refunded upon return of all your copies of the Program.

2) PROGRAM

The Warranty Period for this Program is for three months from the date of its delivery to the original user as evidenced by a receipt.

IBM warrants that this Program, if unaltered, will conform to its Program Specifications during the Warranty Period when such Program is properly used on a machine for which it was designed. If notified during the Warranty Period that the Program contains defects such that it does not conform to its Program Specifications, IBM will 1) attempt to make the Program operate as warranted a) if prior to the Service Expiration Date, by providing a correction, or b) if after the Service Expiration Date, by providing any existing corrections, or 2) replace the Program with a functionally equivalent Program, as determined by IBM. In the event that IBM does not provide such a remedy, you may terminate your license and your money will be refunded upon return of all your copies of the Program.

IBM does not warrant that any other defects in the Program will be corrected or that the operation of the Program will be uninterrupted.

This limited warranty will apply only if the Program is licensed and located in the United States or Puerto Rico.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow the exclusion of implied warranties, so the above exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Following the end of the Warranty Period, Program Services may be available. The License Information contains details on such availability.

If you have a question as to where you may obtain warranty service, see the Statement of Service in the License Information for this Program.

Program Specifications

The IBM LAN Manager functions are:

- Manages a single-segment or multi-segment Local Area Network (LAN) comprised of one or more IBM Token-Ring LAN segments (rings) or IBM PC Network LAN segments (buses) or a combination of both. A separate IBM LAN Manager is required for each network to be managed.
- Monitors an IBM Token-Ring LAN segment for hard and soft errors. Error conditions are reported to the operator and recorded on permanent storage (disk).
- Monitors a broadband IBM PC Network LAN segment for bus errors. Error conditions are reported to the operator and recorded on permanent storage (disk).
- Provides for optional logging of network events such as stations joining and withdrawing from the network.
- Produces reports of recorded events. These reports can be displayed and/or printed.
- Displays the status of the IBM Token-Ring or broadband IBM PC Network LAN segments.
- Provides the following operator control functions:
 - Interrogate a station to get its adapter hardware information.
 - Remove a station adapter from the network.
 - Display the network's configuration.
 - Check that the LAN Manager can successfully communicate over the LAN.
 - Perform a connectivity test to verify that a functioning path exists between two adapters on the IBM Token-Ring Network.
 - Assign a name to associate with an adapter's address; used as an alternate reference for stations in commands and messages.
- Communicates with a NetView host, using the Operating System/2 Extended Edition communication facility or the NetView/PC program to forward alert notifications to the host and to respond to Service Point Command Services commands from the host.

Operating Environment

The IBM LAN Manager is designed to operate with the following hardware and software.

Machine Requirements

- IBM Computer (any one of the following):
 - IBM Personal Computer XT Model 286
 - IBM Personal Computer AT (5170)
 - IBM Personal System/2 (Model 50, 60, 70, or 80).
- Memory: There must be at least 800 KB of virtual memory available to the LAN Manager.
- Fixed disk: One fixed disk with a minimum of 2.6 MB of available space
- One diskette drive (any of the following):
 - 5.25-inch drive (1.2 MB)
 - 3.5-inch drive (1.44 MB)
- Display: Any monochrome or color display supported by OS/2 Extended Edition, Version 1.1.
- Adapter - one of the following:
 - IBM Token-Ring Network:
 - IBM Token-Ring Network PC Adapter
 - IBM Token-Ring Network PC Adapter II
 - IBM Token-Ring Network PC Adapter/A
 - IBM Token-Ring Network 16/4 Adapter
 - IBM Token-Ring Network 16/4 Adapter/A
 - IBM PC Network:
 - IBM PC Network Adapter II
 - IBM PC Network Adapter II/A
 - IBM PC Network Adapter II - Frequency 2
 - IBM PC Network Adapter II/A - Frequency 2
 - IBM PC Network Adapter II - Frequency 3
 - IBM PC Network Adapter II/A - Frequency 3.
- Printer: (*Optional*) Any printer supported by OS/2 EE, Version 1.1.

Program Requirements

- IBM Operating System/2 (OS/2) Extended Edition
- For a multi-segment network, if the LAN Manager is to monitor the remote LAN segments, one or more of the following bridge programs is needed:
 - IBM Token-Ring Network Bridge Program Version 1.1 (ring to ring)
 - IBM Token-Ring Network Bridge Program Version 2.0 (ring to ring)
 - IBM PC Network Bridge Program Version 1.0 (bus to bus, bus to ring)
 - IBM Token-Ring Network Bridge Program, Version 2.1 (ring to ring)

Prerequisite Software Requirements for Host Connectivity

- IBM NetView, Release 3.0, to send alerts to the host and receive SPCS commands from the host (using the communication facilities of OS/2 or NetView/PC, Version 1.2).
- IBM NetView, Release 2.0, to send alerts to the host (using the facilities of OS/2 or NetView/PC, Version 1.2).

Licensed Program Materials Availability

This licensed program is available in object code only. The available licensed materials are not restricted. The source licensed program materials are not available.

Supplemental Terms

- There is no testing period for the Basic License.
- An Installation/Location License is not applicable. A separate license is required for each machine on which the licensed program will be used.

Statement of Service

IBM will provide service for valid program-related defects in the IBM LAN Manager to program licensees at no additional charge. Program service is available until September 30, 1990, or until after 90 days written notice by IBM that the service period has been terminated, whichever is sooner. Specify product identifier 560122701 when requesting service.

The way each licensee obtains access to program service depends on the marketing channel through which the license was obtained.

For example, in the United States and Puerto Rico, if the IBM LAN Manager was obtained through:

- An authorized IBM Personal Computer dealer.
- The IBM North/Central or IBM South/West Marketing Divisions.

Requests for program service should be made through the dealer.

Requests for program service should be made through the service coordinator of the licensee's company.

The service coordinator is a representative of the customer who serves as the interface between end users and the IBM support location for IBM licensed program defect support. The service coordinator is registered by the IBM branch office, under the terms of the Quantity Discount Agreement. The service coordinator's responsibilities include, but are not limited to, problem determination, problem source identification, submission of problem reports, application of maintenance, and action on IBM support organization recommendations.

The service coordinator may call the IBM Support Center (1-800-237-5511) at any time. The IBM Support Center will notify the IBM LAN Service Group and will contact the service coordinator Monday through Friday between 8 a.m. and 5:00 p.m., Eastern time.

If the IBM LAN Manager is obtained through transfer of license from another party under the conditions of the IBM Program License Agreement supplied with this product, the new licensee may obtain program service through the access arrangement provided for the original licensee.

When a license is transferred, if the original license was obtained through the IBM North/Central or IBM South/West Marketing Divisions, the previous licensee is responsible for contacting the IBM marketing representative to make arrangements to transfer service entitlement to the new licensee. The new licensee must also establish a qualified service coordinator to work with IBM central service.

IBM does not guarantee service results, or that the program will be error-free, or that all program defects will be corrected.

When a report of a defect in an unaltered portion of a supported release of the program is submitted, IBM will respond by issuing one of the following:

- Defect correction information, such as corrected documentation, corrected code, or notice of availability of corrected code
- A restriction notice
- A bypass.

Corrected code is provided on a cumulative basis on diskettes; no source code is provided. Only one copy of the corrections with supporting documentation will be issued to the licensee, or the agent of the licensee reporting the defect. IBM will authorize various agents, such as IBM Personal Computer dealers and service coordinators of IBM North/Central and IBM South/West Marketing Division customers, to make and distribute a copy of the corrections, if needed, to each IBM LAN Manager licensee that they serve.

The total number of copies of an update distributed to IBM LAN Manager licensees within a customer's location may not exceed the number of copies of the IBM LAN Manager licensed to the customer.

IBM does not plan to release updates of the IBM LAN Manager code on a routine basis for preventive service purposes. However, should IBM determine that there is a general need for a preventive service

update, it will be made available to all licensees through the same process used to distribute general IBM LAN Manager updates.

Following the discontinuance of all program services, this program will be distributed on an "as is" basis, without warranty of any kind either express or implied.

Additional Information

Type/Duration of Program Services

Central Service, including a support center, will be available until September 30, 1990. See "Statement of Service" on page C-6 for details.

When Central Service is specified one or more service locations will be designated which will accept documentation in a format described by IBM indicating that a problem is caused by a defect in the licensed program.

Other Documentation

Any other documentation with respect to this licensed program, including any such documentation referenced herein, is provided for information purposes only and does not extend or modify the material contained in the License Information.

Appendix D. Worksheets

These pages include the following worksheets:

- System Definition Worksheet
- Adapter Definition Worksheet
- Bridge Definition Worksheet.

Use the System Definition Worksheet to prepare the system for operation and to record the system parameters for future reference.

Use the Bridge Definition Worksheet to prepare new or changed bridge definitions for use in the Bridge Definition function of the LAN Manager.

Use the Adapter Definition Worksheet to prepare new or changed adapter definitions for use by the LAN Manager.

System Definition Worksheet

Use this worksheet to record when you select **System Definition**.

Adapter Number

Adapter Number of the LAN Manager's adapter:

(Check one)

- 0 Primary (default)
- 1 Alternate

The following information regarding the LAN Manager's adapter is not required for data entry during **System Definition**. However, you will find it useful later when operating the LAN Manager. The information is available from the **LAN Manager Profile** panel.

Adapter Name _____

Address _____

LAN segment number _____

Group Address _____

Reporting Link

Link Type:

- 0 Controlling (default)
- 1 Observing
- 2 Observing
- 3 Observing

Reporting Link Password _____

LAN Name

LAN Name _____

Security

Operator password— *Record on a sheet of paper and keep locked away.*

Trace Option

Permit frame tracing (*check one*)

- Allow all adapters to trace (*default*)
- Allow none to trace
- Allow list of adapters to trace (*List adapters below*)

Adapter Name or Adapter Address (*up to 8*)

Host Connection

(*Check one*)

- OS/2
- NetView/PC
- None

If you selected "OS/2," enter the Service Point name _____

Bridge Definition Worksheet

Page ___ of ___

Bridge Name _____**Bridge Number** _____**Link during Bringup:** Yes No**LAN segment number** _____

← (Bridge) ⇒

LAN segment number _____**Adapter Name or Address** _____**Adapter Name or Address** _____**Comments:** _____

Appendix E. Alert Transport Service

Alert Transport Service is a facility contained within the IBM LAN Manager that provides an "alert passthrough" to the NetView host. Devices and software on the LAN that experience error conditions can build alert messages and send them over the LAN to the LAN Manager. The LAN Manager receives the alert messages and forwards them "as is" to the NetView host. The LAN Manager also logs and displays the alert message locally.

What You Need to Know

To use the Alert Transport Service feature of the IBM LAN Manager you will need to know:

- How to build an alert message
- How to build a Logical Link Control (LLC) frame
- How to send and receive LLC frames.

These topics are not discussed in this User's Guide, but further information can be found in the documents listed below. The remainder of this appendix outlines the procedure you should use when sending the alert messages to the LAN Manager from another LAN device.

Detailed information on alerts and Logical Link Control (LLC) can be found in the following documents:

SNA/Management Services Alert Implementation Guide
(GC31-6809)

IBM Token-Ring Network Architecture Reference (SC30-3374)

SNA Formats (GA27-3136)

SNA Format and Protocol Reference Manual: Management Services (SC30-3446).

Alert Transport Service Procedure

Use this procedure for sending an alert message from a LAN device to the LAN Manager.

1. Create the Network Management Vector Transport (NMVT), which is the alert message.
2. Generate a 2-byte correlator value.
3. Embed the NMVT and the correlator in the Alert Transport LLC frame. See Figure E-1 on page E-4.
4. Send the frame to the LAN Manager: Send it single-route broadcast to the LAN Manager's functional address (X'C00000002000'), with DSAP = X'F4', from any non-zero SSAP, and with the control field set to the UI command (X'03')
5. Repeat frame transmission up to three times until a response with the same 2-byte correlator value is received from the LAN Manager:
 - Wait one minute for response from LAN Manager
 - If no response received within one minute then retransmit the frame
 - Otherwise (if response received with same correlator value) quit.

When the LAN Manager receives the Alert Transport frame it will:

- Log the alert message for local display at the LAN Manager
- Forward the alert to the NetView host if host-connected
- Send an Alert Transport Received LLC frame, returning the received correlator to the sending station.

Note: Only *controlling* LAN Managers provide the Alert Transport Service. Observing LAN Managers ignore Alert Transport frames.

It is important to avoid sending the same alert message again after the LAN Manager has acknowledged its receipt. This would cause duplication of alert messages at the NetView host.

If a device that sent an alert message does not receive a response from the LAN Manager in the specified time, make sure that a Con-

trolling LAN Manager is indeed on the network and that there is a functioning path between it and the sending device. Existence of a functioning path can be verified at the LAN Manager simply by querying the sending device.

If, after confirming the existence of a path to a controlling LAN Manager, the LAN Manager still does not respond with the Alert Transport Received frame, check to be sure that your Alert Transport frame is properly formed and that the NMVT in it is not larger than 504 bytes. The LAN Manager ignores Alert Transport frames that are improperly formatted or have NMVTs that are larger than 504 bytes.

Alert Transport Frame Format

- Sent from LAN station to LAN Manager
- Major vector and subvectors (values are hexadecimal):

Alert Transport Frame

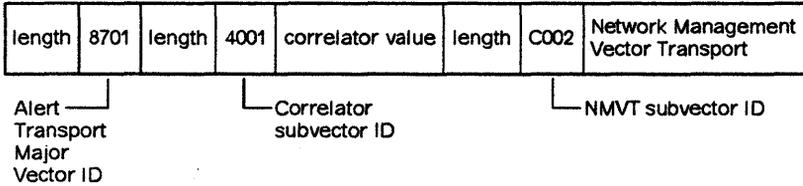


Figure E-1. Alert Transport Frame

Alert Transport Received Frame Format

- Sent from the LAN Manager to the sending station
- Major vector and subvector (values are hexadecimal).

Alert Transport Received Frame

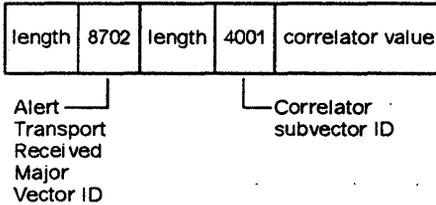


Figure E-2. Alert Transport Received Frame

Appendix F. Bridge Performance Analysis

This appendix describes the bridge performance information available at the IBM LAN Manager Version 2.0. It explains how to obtain the performance information used to evaluate and manage bridge traffic flow for the following IBM bridge programs:

- IBM Token-Ring Network Bridge Program, Version 2.1
- IBM Token-Ring Network Bridge Program, Version 2.0
- IBM Token-Ring Network Bridge Program, Version 1.1
- IBM PC Network Bridge Program 1.0.

The *IBM Local Area Network Administrator's Guide* describes how to use the performance information to evaluate and manage bridge traffic flow.

The bridge programs keep performance counters and statistics to help you evaluate and manage traffic through each bridge:

- **Performance Counters**

- Accumulate the numbers of bytes and frames forwarded and not forwarded from each LAN segment to the other through a bridge
- Can be displayed at the bridge station or the IBM LAN Manager station (for all the bridges listed above)
- Can be recorded by the IBM LAN Manager in a disk file (for all bridges listed above, except the IBM Token-Ring Network Bridge Program, Version 1.1)

- **Performance Statistics**

- A "threshold exceeded" statistic is generated each time:
 - The number of frames not forwarded (due to the target LAN segment being inoperative, adapter congestion, or other reasons) per 10,000 frames arriving at the bridge exceeds a user-specified maximum (Percent Frames Lost Threshold).
 - The number of frames not forwarded (due to telecommunications link errors) exceeds a user-specified maximum (Telecommunications Link Error Threshold).

- The IBM LAN Manager is notified each time the Percent Frames Lost Threshold or Telecommunications Link Error Threshold is exceeded.

Note: Telecommunications link errors apply only to the IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge. The Telecommunications Link Error Threshold value is accessible at the bridge computer only. For more information, refer to the *IBM Local Area Network Administrator's Guide* or the *IBM Token-Ring Network Bridge Program User's Guide*, Version 2.1.

Bridge Program Performance Counters

The bridge programs maintain several counters for each LAN segment connected to a bridge. The counters record the following:

Broadcast frames forwarded

This counter contains the number of broadcast and single-route broadcast frames successfully forwarded from one LAN segment to the other by the bridge.

Broadcast bytes forwarded

This counter contains the number of broadcast and single-route broadcast bytes successfully forwarded from one LAN segment to the other by the bridge.

Not all of the bytes in each frame are counted. The bytes counted for each frame are those between and included in the Access Control Field and the Information Field (see the frame format in Figure F-1 on page F-5).

Non-broadcast frames forwarded

This counter contains the number of non-broadcast frames successfully forwarded from one LAN segment to the other by the bridge.

Non-broadcast bytes forwarded

This counter contains the number of non-broadcast bytes successfully forwarded from one LAN segment to the other by the bridge.

Not all of the bytes in each frame are counted.

- For bridges connecting two rings, the bytes counted for each frame are those between and included in the Access Control Field and the Frame Check Sequence (see the frame format in Figure F-1 on page F-5).
- For bridges connecting one bus and one ring or two buses, the bytes counted for each frame are those between and included in the Access Control Field and the Information Field (see the frame format in Figure F-1 on page F-5).

Frames not forwarded: target LAN segment inoperative

- For a target ring:

This counter contains the number of frames discarded by the bridge because the frames arrived during a period when the target ring was beaconing. The count also includes frames waiting at the bridge to be forwarded when the ring began beaconing; these frames are also discarded.

- For a target bus:

This counter contains the number of frames discarded by the bridge because the frames arrived during a period when the target bus was in a continuous-carrier condition or a no-carrier condition. The count also included frames that the bridge discarded after experiencing 16 consecutive collisions in attempting to forward the frames to the target bus.

Note: The IBM Token-Ring Network architecture term for this counter is **Frames discarded**.

Frames not forwarded: adapter congestion

This counter contains the number of frames lost because:

- Frames are coming to the bridge from the source LAN segment faster than the bridge program can process them and forward them to the destination LAN segment.
- The destination LAN segment is too busy to accept frames as fast as the bridge program is processing and forwarding them.

Note: The IBM Token-Ring Network architecture term for this counter is **Frames not received**.

Frames not forwarded: telecommunications link error

This counter contains the number of frames not forwarded due to errors on the telecommunications link connecting the two stations of a bridge using the remote bridge function.

Note: The IBM Token-Ring Network architecture term for this counter is **Frames discarded—internal errors**.

Bytes not forwarded: telecommunications link error

This counter contains the number of bytes not forwarded due to errors on the telecommunications link connecting the two stations of a bridge using the remote bridge function.

Note: The IBM Token-Ring Network architecture term for this counter is **Bytes discarded—internal errors**.

Frames not forwarded; other reasons

This counter contains the number of frames not forwarded due to an IBM adapter failure or to the presence of a non-IBM adapter on the network, causing invalid frame lengths or invalid Routing Information (RI) fields. The specific occurrences counted are:

- Frame length is less than the minimum allowed.
 - Minimum broadcast frame = 20 bytes
 - Minimum non-broadcast frame = 22 bytes.
- Frame length exceeds the maximum allowed (some adapter types allow lower maximums than these absolute values):
 - IBM Token-Ring Network maximums
 - 16 Mbps ring = 8144 bytes
 - 4 Mbps ring = 4472 bytes
 - IBM PC Network maximum
 - 2 Mbps bus = 2052 bytes

Note: For the IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge,

refer to the bridge's User's Guide to determine the IBM Token-Ring Network maximums.

- RI field is invalid
 - Source LAN segment number is in the RI field, but is not last (broadcast frames only)
 - Duplicate LAN segment number(s) in the RI field (non-broadcast frames only)
 - Source ring number is not in the RI field (IBM Token-Ring Network broadcast frames only)
 - Destination ring number is not in the RI field (IBM Token-Ring Network non-broadcast frames only)

SD	AC	FC	Dest. Addr.	Source Addr.	Rout.	Info. Field	FCS	ED	FS
1 Byte	1 Byte	1 Byte	6 Bytes	6 Bytes	0-18 Bytes		4 Bytes	1 Byte	1 Byte

Figure F-1. Frame Format

The definitions used in the frame format are:

- SD Starting Delimiter
- AC Access Control Field
- FC Frame Control Field
- FCS Frame Sequence Check
- ED Ending Delimiter
- FS Frame Status Field

The bridge program contains three copies of the performance counters:

- One copy is used by the bridge program user interface. The user can display the Bridge Program Performance Counters panel to obtain the current values of the counters.

If these counters reach the maximum values that they can contain, the counters "roll over" to zeros and counting continues. When any of the counters "roll over," the bridge programs display a message indicating that the counters have overflowed.

- The second copy of the counters is used by the Bridge Program Performance Statistics function to determine when the **Percent**

Frames Lost threshold or **Telecommunications link error threshold** has been exceeded.

Note: The **Telecommunications link error threshold** applies only to the IBM Token-Ring Network Bridge Program Version 2.1 operating as a remote bridge. Refer to the *IBM Token-Ring Network Bridge Program User's Guide*, Version 2.1, or the *IBM Local Area Network Administrator's Guide* for more information.

If the counts reach the maximum values that these counters can contain, they are not incremented again until they are reset to zeros when the next one-minute measurement interval begins.

- The third copy of the counters is used to respond to network manager program requests to receive the current counter values from the bridge programs. A network manager program (such as the IBM LAN Manager) can establish a communication link with a bridge program, and request to receive the counter values over the link from the bridge program. The IBM LAN Manager provides functions to:
 - Request and display the current counter values
 - Record the counter values in a disk file each time a specified time interval elapses.

If the counts reach the maximum values that these counters can contain, the counters “roll over” to zeros and counting continues. These counters are reset to zeros when the bridge programs are restarted, but cannot be reset by the user. This allows more than one network manager program to obtain the same counter information from a bridge.

Bridge Traffic Evaluation

The bridge program performance information can be used to obtain:

- A characterization of the traffic flowing through a bridge
- An evaluation of bridge traffic on a LAN segment to which more than one bridge is connected.

The **first step** in evaluating bridge traffic is to determine the length of time for which you want a bridge program to count frames and bytes before you begin the analysis. This length of time is hereafter called the *measurement period* in this discussion.

The length of the measurement period can be from a few minutes to several hours, and will vary with the purpose of the evaluation.

A short measurement period (a few minutes) could be used to:

- Isolate a specific problem
- Observe traffic at a particular time of day
- Observe traffic generated as particular devices or programs use the network.

A longer measurement period (an hour or more) can provide information about average bridge traffic during a busy period of the day.

The **second step** is to obtain the bridge program performance counter values accumulated during the measurement period.

The counter values can be obtained at the IBM LAN Manager station by:

- Using the **Bridge Profile** function to display the **Bridge Performance Counters** panel
- Using the **Configure Bridge** function to specify a non-zero performance notification interval to begin recording the counters in a disk file. The performance notification interval determines the rate at which the bridge performance counters are logged during the measurement period.

The performance counter values can be used in a series of calculations to provide additional information about the bridge traffic flow, including:

- User traffic through a bridge in frames/second and bytes/second
- Percentage of frames not forwarded due to causes indicated by the counters.

There are two methods of obtaining the counter values and performing the calculations:

- **The Worksheet Method**
 - Display the counters at the IBM LAN Manager station.
 - Manually record the counter values on a worksheet (included in this appendix).

- Use the recorded values to do the calculations using the Bridge Performance Analysis Calculations Worksheet and the instructions found in the *IBM Local Area Network Administrator's Guide*, or the IBM Bridge Program user's guide.

Refer to the *IBM Local Area Network Administrator's Guide* for detailed instructions on using the worksheets and doing the calculations.

- **The Counter File Method**

- Use the function provided by the IBM LAN Manager to record the counter values in a disk file each time the specified measurement period elapses.
- Use a program that you write to read the file, do the analysis calculations, and present the results.

See "The Counter File Method" on page F-9 and refer to the *IBM Local Area Network Administrator's Guide* for more information on using the counter file.

The Counter File Method

The IBM LAN Manager 2.0 provides a function that:

- Automates the recording of bridge program performance counter values for one or more measurement periods
- Can record counter values for each bridge with which the IBM LAN Manager has established a reporting link (up to 64 bridges).

When you use the **Configure Bridge** function of the IBM LAN Manager to specify a non-zero performance notification interval for a bridge, the IBM LAN Manager:

- Creates a disk file with the same name as the bridge and a file extension of PRF.
- Requests the bridge program at the bridge to begin sending counter values each time the specified performance notification interval elapses.
- Writes a record in the file each time counter values are received from the bridge.

The Counter File

The IBM LAN Manager creates a file on disk each time you specify a non-zero performance notification interval for a bridge with which there is an established communication link.

Each disk file in which the IBM LAN Manager records counter values has the following characteristics:

- Each file contains one header record and up to 1440 binary data records.
 - 1440 data records could provide a counter reading every minute for 24 hours.
- Each record is 100 characters long; the data in each record is binary.
 - Figure F-2 on page F-11 shows the header record format
 - The fields in the data record are listed on page F-12.

The header record is written as soon as the file is created. The first data record is written as soon as the first interval elapses and the IBM LAN Manager receives the first set of counter values.

Counter values are recorded in the file each time the interval elapses, until:

- The file is full (contains 1440 data records)
- You specify a performance notification interval of 0 to the IBM LAN Manager.

When the file is full (contains 1440 data records), the IBM LAN Manager:

- Closes the file
- Resets the performance notification interval for that bridge to zero (counter accumulation stops)
- Logs message 186, "Bridge parameter has been changed," in the Event Log.

If a counters file for a bridge already exists on disk, the file is erased and a new file is created the next time a non-zero interval is specified for that bridge. If you want to save counter files for later analysis or history, you need to rename the files or copy them to another disk or diskette.

Bridge Name	Date	Time	First LAN Segment Number	Bridge Number	Second LAN Segment Number	Measurement Period	Reserved
-------------	------	------	--------------------------	---------------	---------------------------	--------------------	----------

Figure F-2. Bridge Performance Counter File: Header Record Format

The Bridge Name is in ASCII; the rest of the fields in the header record are binary.

The fields in the header record contain the following information:

Byte	Description
1-8	Bridge Name (in ASCII) The name specified for this bridge in the Bridge Definition.
9-10	Year of the date when the file was started
11	Month of the date when the file was started
12	Day of the date when the file was started
13	Hours of the time when the file was started The time is in the format HH:MM:SS (H = hours; M = minutes; S = seconds)
14	Minutes of the time when the file was started
15	Seconds of the time when the file was started
16-17	First LAN segment number
18	Bridge number
19-20	Second LAN segment number
21	Measurement period The performance notification interval, in minutes.
22-100	Reserved

Fields in the data records are binary and contain the following information:

Bytes 1-50	Counters for First LAN Segment
1-4	Broadcast frames forwarded
5-10	Broadcast bytes forwarded
11-14	Non-broadcast frames forwarded
15-20	Non-broadcast bytes forwarded
21-24	Frames not forwarded: target LAN segment inoperative
25-28	Frames not forwarded; adapter congestion
29-32	Frames not forwarded: telecommunications link error
33-38	Bytes not forwarded: telecommunications link error
39-42	Frames not forwarded: other reasons
43-50	Reserved
Bytes 51-100	Counters for Second LAN Segment
51-54	Broadcast frames forwarded
55-60	Broadcast bytes forwarded
61-64	Non-broadcast frames forwarded
65-70	Non-broadcast bytes forwarded
71-74	Frames not forwarded: target LAN segment inoperative
75-78	Frames not forwarded; adapter congestion
79-82	Frames not forwarded: telecommunications link error
83-88	Bytes not forwarded: telecommunications link error
89-92	Frames not forwarded: other reasons
93-100	Reserved

Bridge Performance Analysis Worksheet

For the IBM LAN Manager

Instructions for completing this worksheet are on the back of the worksheet.

Bridge Identification _____

Bridge Program Level _____

First Reading of Counters _____ at _____:_____:_____

Second Reading of Counters _____ at _____:_____:_____

LAN Segment Types _____

		LAN Segment _____ +	LAN Segment _____ =	Bridge Total
Broadcast frames	Second	_____	_____	
	-First	_____	_____	
	= Result: (A1)	_____ + (A2) _____	= (A3) _____	
Broadcast bytes	Second	_____	_____	
	-First	_____	_____	
	= Result: (B1)	_____ + (B2) _____	= (B3) _____	
Non-broadcast frames	Second	_____	_____	
	-First	_____	_____	
	= Result: (C1)	_____ + (C2) _____	= (C3) _____	
Non-broadcast bytes	Second	_____	_____	
	-First	_____	_____	
	= Result: (D1)	_____ + (D2) _____	= (D3) _____	
Frames Not Forwarded Because:				
Target LAN segment inoperative	Second	_____	_____	
	-First	_____	_____	
	= Result: (E1)	_____ + (E2) _____	= (E3) _____	
Adapter congestion	Second	_____	_____	
	-First	_____	_____	
	= Result: (F1)	_____ + (F2) _____	= (F3) _____	
Other reasons	Second	_____	_____	
	-First	_____	_____	
	= Result: (G1)	_____ + (G2) _____	= (G3) _____	

At the LAN Manager station:

- 1 Use the Bridge Profile function to display the first **Bridge Profile** panel.
- 2 Record the Bridge Program Level on the worksheet (the first four characters of the Bridge Version information).
- 3 Display the **Bridge Profile Performance Counters** panel (the second **Bridge Profile** panel).
- 4 Write on the worksheet:
 - Date and time of the first reading
 - LAN segment types
 - LAN segment numbers.
- 5 In the spaces labeled "First," write the values of the counters shown on the panel.
- 6 Wait _____ minutes. (*Write the length of the measurement period in the blank space.*) Then display the Bridge Profile Performance Counters again.
- 7 Write on the worksheet the date and time of the second reading.
- 8 In the spaces labeled "Second," write the values of the counters shown on the panel.
- 9 Subtract the "First" values from the "Second" values. Write the answers in the appropriate "Result" spaces.

Note: If the "First" value is larger than the "Second" value for a counter, the counter rolled over during the measurement period. Follow the instructions in the *IBM Local Area Network Administrator's Guide* to obtain the correct result.
- 10 Add the "Result" values for the two LAN segments to obtain each Bridge Total.

Remote Bridge Performance Analysis Worksheet

For the IBM LAN Manager

Instructions for completing this worksheet are on the back of the worksheet.

Bridge Identification _____

Bridge Program Level _____

First Reading of Counters _____ at _____:_____:_____

Second Reading of Counters _____ at _____:_____:_____

LAN Segment Types _____

Frames Forwarded Values for:	LAN Segment _____ +	LAN Segment _____ =	Bridge Total
Broadcast frames	Second _____	_____	
	-First: _____	_____	
	= Result: (Q1) _____ + (Q2) _____ = (Q3) _____		
Broadcast bytes	Second _____	_____	
	-First: _____	_____	
	= Result: (R1) _____ + (R2) _____ = (R3) _____		
Non-broadcast frames	Second _____	_____	
	-First: _____	_____	
	= Result: (S1) _____ + (S2) _____ = (S3) _____		
Non-broadcast bytes	Second _____	_____	
	-First: _____	_____	
	= Result: (T1) _____ + (T2) _____ = (T3) _____		

Frames Not Forwarded Because:	LAN Segment _____ +	LAN Segment _____ =	Bridge Total
Target LAN segment inoperative	Second _____	_____	
	-First: _____	_____	
	= Result: (U1) _____ + (U2) _____ = (U3) _____		
Adapter congestion	Second _____	_____	
	-First: _____	_____	
	= Result: (V1) _____ + (V2) _____ = (V3) _____		
Telecommunications link error (frames)	Second _____	_____	
	-First: _____	_____	
	= Result: (W1) _____ + (W2) _____ = (W3) _____		
Other reasons	Second _____	_____	
	-First: _____	_____	
	= Result: (Z1) _____ + (Z2) _____ = (Z3) _____		

At the LAN Manager station:

- 1 Use the Bridge Profile function to display the first **Bridge Profile** panel.
- 2 Record the Bridge Program Level on the worksheet (the first four characters of the Bridge Version information).
- 3 Display the **Bridge Profile Performance Counters** panel (the second **Bridge Profile** panel).
- 4 Write on the worksheet:
 - Date and time of the first reading
 - LAN segment types
 - LAN segment numbers.
- 5 In the spaces labeled "First," write the values of the counters shown on the panel.
- 6 Wait _____ minutes. (*Write the length of the measurement period in the blank space.*) Then display the Bridge Profile Performance Counters again.
- 7 Write on the worksheet the date and time of the second reading.
- 8 In the spaces labeled "Second," write the values of the counters shown on the panel.
- 9 Subtract the "First" values from the "Second" values. Write the answers in the appropriate "Result" spaces.

Note: If the "First" value is larger than the "Second" value for a counter, the counter rolled over during the measurement period. Follow the instructions in the *IBM Local Area Network Administrator's Guide* to obtain the correct result.
- 10 Add the "Result" values for the two LAN segments to obtain each Bridge Total.

List of Abbreviations

APPC	Advanced program-to-program communications	NAUN	Nearest active upstream neighbor
CSMA/CD	Carrier sense multiple access / collision detect	NMVT	Network management vector transport
DLC	Data link control	OS/2 EE	Operating System/2 Extended Edition
DOS	Disk operating system	PC	Personal computer
KB	Kilobytes	SAP	Service Access Point
LAN	Local area network	SNA	System Network Architecture
LLC	Logical link control	SPCS	Service point command service
Mbps	Million bits per second	VTAM	Virtual Telecommunications Access Method
NADN	Nearest active downstream neighbor		

Glossary

This glossary defines terms and abbreviations used in this publication. It includes terms from the *Dictionary of Computing*, SC20-1699-07.

A

accessory. An IBM designation for a separately orderable part that (1) has no type number, (2) is for purchase only, and (3) does not receive normal IBM maintenance.

access unit. See multistation access unit.

active. Able to communicate on the network. On a Token-Ring LAN segment, an adapter is active if it is able to pass tokens on the network.

active monitor. A function in a single adapter on a ring network that initiates the transmission of tokens and provides token error recovery facilities. Any active adapter on the ring has the ability to provide the active monitor function if the current active monitor fails.

adapter. In the IBM Token-Ring or the IBM PC Network, the circuit card within a communicating device, and its associated software, that enable the device to communicate over a local area network.

adapter address. A 12-digit hexadecimal number which identi-

fies the location of an adapter installed in the network.

application program. A program written for or by a user that applies to the user's work.

attaching device. Any device that is physically connected to a network and can communicate over the network.

B

beacon. A frame sent by an adapter on a ring network indicating a serious ring problem, such as a broken cable. An adapter is said to be *beaconing* if it is sending such a frame.

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

broadband network. A local area network in which information is encoded, multiplexed and transmitted through modulation of carriers.

bus. A network configuration where a series of nodes (attaching devices, such as IBM Personal Computers) are connected to a main cable.

C

carrier. See *no carrier* or *continuous carrier*.

component. Any part of a network other than an attaching device, such as an access unit.

configuration list. A list of all the names and addresses of stations attached to a LAN segment.

continuous carrier. On a broadband PC Network, a condition in which a carrier signal is being constantly broadcast on a given frequency. No further information can be modulated on that frequency. Synonymous with *hot carrier*.

D

device. An input/output unit such as a terminal, display, or printer. See *attaching device*.

downstream. On a ring network, the direction of data flow. Contrast with *upstream*.

F

frame. The unit of transmission in some local area networks, including the IBM Token-Ring Network and the IBM PC Network. It includes delimiters, control characters, information, and checking characters.

functional address. A subset of group addresses that is encoded in bit-significant format, thereby

allowing multiple individual groups to be designated by a single address.

G

group address. The address of a group of logically-related adapters.

H

hard error. An error condition on a ring network that requires that the ring be reconfigured or that the source of the error be removed before the ring can resume reliable operation.

hop count. The number of bridges through which a frame has passed on the way to its destination.

hop count limit. The maximum number of bridges through which a frame may pass on the way to its destination.

host. The primary or controlling computer in a multi-computer installation or network.

hot carrier. See *continuous carrier*

I

IBM PC Network. A low-cost broadband network that allows attached IBM personal computers to communicate and share resources.

idles. Signals sent along a ring network when neither frames nor tokens are being transmitted.

L

LAN segment. Any portion of a local area network (a single ring or bus) that can operate independently, but which is connected to the establishment network through bridges, controllers or gateways.

lobe. In the IBM Token-Ring Network, the section of cable (which may consist of several segments) that attaches a device to an access unit.

lobe receptacle. An outlet on an access unit for connecting a lobe.

local area network. A network in which communications are limited to a moderate-sized geographic area such as a single office building, warehouse, or campus and which do not generally extend across public rights-of-way.

M

main ring path. The part of the ring made up of access units, repeaters, and the cables connecting them.

microcode. One or more microinstructions. A microinstruction is an instruction that controls data flow and sequencing in a processor at a more fundamental level than a machine instruction.

monitored adapter. Each Adapter Definition

has a "Monitor Adapter?" field which the LAN Manager operator

can set to "yes" or "no" to designate an adapter as monitored or not monitored. If an adapter is monitored (yes), the LAN Manager generates an alert if the adapter is not active on the network.

multistation access unit. In the IBM Token-Ring Network, a wiring concentrator that can connect up to eight lobes to a ring network.

N

NAUN. Nearest active upstream neighbor. For any given station on a ring network, the station that is sending frames or tokens directly to it.

NetView. The host network manager program.

no carrier. On a broadband network, a condition in which a carrier signal is not being broadcast on a given frequency. In the absence of such a carrier, no information can be modulated on that frequency.

node. An endpoint of a link or a junction common to two or more links in a network.

P

panel. The complete set of information shown in a single display on a computer screen.

PC Network. See *IBM PC Network*.

R

remote bridge. A function of the IBM Token-Ring Network Bridge Program, Version 2.1. This function allows two bridge computers to use a telecommunication link to connect two LAN segments.

remove. To take an attaching device off the ring.

ring (network). A network configuration where a series of attaching devices are connected by unidirectional transmission links to form a closed path.

ring error limit. In the LAN Manager, the point at which the number of soft errors can make ring operation unreliable.

ring monitor. Synonym for active monitor.

ring sequence. The order in which devices are attached on a ring network.

ring status. The condition of the ring.

S

server. On a local area network, a data station that provides facilities to other data stations. Examples are a file server, print server and mail server.

soft error. An intermittent error on a ring network that causes data to be retransmitted.

Note: A soft error does not, by itself, affect the network's overall reliability. If the number of soft errors reaches the ring error limit, reliability is affected.

station. A communication device attached to a network.

symbolic name. A name that can be used instead of an adapter address to identify an adapter location. The name may be up to 16 characters long. Synonyms: symbolic adapter name; adapter name.

T

token. A particular message or bit pattern that signifies permission to transmit along the token-ring network. When the token has data appended to it, it becomes a *frame*.

token ring. A network with a ring topology that passes tokens from one attaching device (node) to another. A node that is ready to send can capture the token and insert data for transmission.

translator. IBM PC Network Translator Unit. Each node on an IBM PC Network sends information at a frequency of 50.75 MHz to the frequency translator. The frequency translator transmits this information back to the nodes at a frequency of 219.0 MHz. IBM PC Network adapters that do not use these frequencies will not function with the IBM PC Network Translator.

U

universal address. The address permanently encoded in an adapter at the time of manufacture.

upstream. In the direction opposite to data flow or toward the source of

transmission. Contrast with *downstream*.

W

wire fault. An error condition caused by a break in the wires or a short between the wires (or shield) in a segment of cable.

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