

Service Manual





Multiprotocol Switched Services (MSS) Server

GY27-0354-01

Service Manual

Note

Before using this information and the product it supports, be sure to read the safety information under Appendix A, "Safety Information" on page A-1 and the general and emission notices under Appendix B, "Notices" on page B-1.

| **Second Edition (January 1997)**

| This edition applies to the Version 1 Release 1.1 of the Nways Multiprotocol Switched Services (MSS) Server.

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Summary of Changes For Version 1 Release 1.1

The following are the hardware enhancements for the MSS Server in this release:

- FDDI adapter
- V33.6 V/D/F Modem
- ATM adapter upgraded to enhance performance

The following are the software enhancements for the MSS Server in this release:

- Support for the FDDI adapter and the V33.6 modem
- Improvements to ELAN and LEC to support ATM UNI 3.0 and 3.1 signalling
- IBM LEC support
- Super ELAN support
- Support for bridging as described in RFC 1483
- Quality of Service (QoS) feature
- Next Hop Routing Protocol (NHRP)
- Improved BUS frame throughput
- Support for virtual ATM interfaces
- AppleTalk 2 support
- Redundant IP gateway support
- Redundant ARP server support
- Helps for the World Wide Web interface
- Command History for the Command Line Interface

The technical changes and additions are indicated by a vertical line (|) to the left of the change.

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About This Manual

This manual describes how to service the MSS Server. The primary method of problem determination by the Level 1 Support Center will be through the dial-in connection through a *standard* PCMCIA modem in the 8210 MSS Server or the MSS Server. Some diagnostics and service will be provided through a Web browser. Level 1 Support Center will run the hardware tests.

There are two types of MSS Server: the standalone type is the 8210 MSS Server, and the MSS Server Module is the blade, which can be installed in the 8260 Nways Multiprotocol Switching Hub. Unless explicitly stated, the term *MSS Server* applies to both the 8210 MSS Server and the MSS Server Module.

The hardware tests and removal and replacement procedures are described in this manual. It can be used to train service representatives and for reference when servicing an MSS Server. Service for the MSS Server is to be performed by a trained person only.

How This Manual Is Organized

This manual is organized with the following sections:

Chapter 1 briefly describes the MSS Server and provides pointers to information in this manual about tools for diagnosing hardware and operational code problems for the MSS Server.

Chapter 2 describes the various methods for remotely accessing the MSS Server.

Chapter 3 describes how to use the Operational Diagnostics utility.

Chapter 4 describes how to use the MSS Server Firmware.

Chapter 5 describes how to manage MSS Server configuration files.

Chapter 6 describes the removal and replacement procedures for the MSS Server field replaceable units (FRUs).

Appendix A contains important safety information which you should read before attempting any service procedure on the MSS Server.

Appendix B contains general and emission notices which you should read before attempting any service procedure on the MSS Server.

Appendix C lists the part numbers for the FRUs and an exploded view of the hardware components for the MSS Server.

Appendix D lists error codes for the MSS Server firmware.

Appendix E describes the electrical, environmental, and physical characteristics of the MSS Server

Appendix F describes the LED status indicators for the 8210 MSS Server.

Appendix G describes the LED status indicators for the MSS Server Module.

MSS Server Library

The following hardcopy publications are shipped with the product. The manuals in this list are also included in displayable softcopy form on the Multiprotocol Switched Services (MSS) Softcopy Library CD-ROM (SK2T-0378). This CD-ROM is shipped with initial orders for the MSS Server.

The reference cards, the International Program License Agreement, License Information, and the safety information booklet are shipped in hardcopy only and are not included on the CD-ROM.

- *IBM 8210 Nways Multiprotocol Switched Services (MSS) Server Setup and Problem Determination Guide, GA27-4140*
- *IBM 8210 Nways Multiprotocol Switched Services (MSS) Server Operations Reference Card, GX27-4017*
- *CAUTION: Safety Information - Read This First, SD21-0030*
- *International Program License Agreement*
- *License Information*
- *IBM Nways Multiprotocol Switched Services (MSS) Server Module Reference Card, GX27-4018*
- *IBM Nways Multiprotocol Switched Services (MSS) Server Module Setup and Problem Determination Guide, GA27-4141*

The following publications are not shipped in hardcopy, but are offered in softcopy form on the Multiprotocol Switched Services (MSS) Softcopy Library CD-ROM (SK2T-0378). All of these manuals can be separately ordered in hardcopy form through your IBM marketing representative.

- *IBM Multiprotocol Switched Services (MSS) Server Introduction and Planning Guide, GC30-3820*
- *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference, SC30-3818*
- *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 2: User's Guide and Protocol Reference, SC30-3819*
- *Event Logging System Messages Guide, SC30-3682*
- *IBM 8210 Nways Multiprotocol Switched Services (MSS) Server Service Manual, GY27-0354*

Chapter 1. Introduction

This chapter briefly describes the MSS Server, the functions it performs in an ATM network, and the ways to provide hardware and operational code service using the tools provided. Pointers are given to the individual chapters in this manual that provide more detail.

Additionally, a section is provided to explain the various ways you can access the MSS Server. This information is covered in the *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference*, SC30-3818 but is repeated in this chapter for your convenience.

Product Description

A complete product description can be found in *Multiprotocol Switched Services (MSS) Server Introduction and Planning Guide*, but a summary is given here for your convenience. The MSS Server product consists of the hardware, firmware, and the operational code. Each is briefly described as follows.

MSS Server Operational Code

The MSS Server will support devices that run on ATM, including ATM-attached workstations, ATM bridges, and ATM LAN switches. In this environment, the MSS Server performs these functions:

- ATM Forum-Compliant LAN emulation
- Classical IP over ATM
- Standards-based routing and bridging support

A brief description of these functions follows in this section. The MSS Server acts as a LAN emulation server and a server for Classical IP over ATM. It enables you to create emulated LANs (ELANs) and virtual IP subnetworks. Its bridging and routing functions can connect these types of virtual LAN as if they were physical LANs, IP subnetworks, or IPX subnetworks.

The MSS Server provides ATM campuses with the following services:

- Adapter support for these ATM connections to an ATM switch:
 - 155 Mbps multimode fiber ATM adapter
 - 155 Mbps single-mode optical fiber ATM adapter
 - Dual Ring optical fiber FDDI adapter

You can choose from among these connections to select the one that works best for your ATM switch and environment.

- ATM-forum compliant and IBM LAN emulation service, including support for both Ethernet emulated LANs and token-ring emulated LANs. LAN emulation allows ATM networks to appear as LANs. Using LAN emulation, devices that are connected to existing LANs and devices that are connected to the ATM network can belong to the same emulated LAN (ELAN) and use existing LAN applications.

Devices included in emulated LANs are organized according to their logical groupings rather than their physical locations. Therefore, when a device in an

ELAN or a virtual IP subnet is moved or added to the network, you do not have to provide it with new addresses.

- Enhanced LAN emulation broadcast management support for IP, Novell** IPX**, NetBIOS and source route bridge broadcasts. Reducing broadcasts reduces the traffic on the network and allows better performance and scalability.
- Support for backup LAN emulation service components.
- The following types of bridging support:
 - Source route bridging (SR)
 - Transparent bridging (TB)
 - Source route and transparent bridging without translation
 - Source route transparent bridging (SRT)
 - Source route to transparent bridging (SR-TB). SR-TB is supported only for protocols that use IEEE 802.2 logical link control (such as SNA and NetBIOS).
 - Adaptive source route transparent bridging (ASRT). This is SRT bridging combined with SR-TB. In this type of bridging, source routed traffic can be converted to transparent bridge format. The conversion is not part of the SRT standard.
 - Dual Spanning Tree support
- Standards-based IP routing support on ATM, including support for Classical IP and routing between an ELAN and Classical IP.
- Standards-based Novell IPX routing support on ATM between emulated LANs. IPX routing is supported over emulated LAN interfaces and RFC 1483¹ connections to other routers. The IP and IPX protocols treat emulated interfaces implemented by LECs just like real Ethernet and Token-Ring interfaces.
- Super LANE for Ethernet ATM emulated LANs (**SuperELAN**)
- FDDI routing for connection to FDDI to ATM
- Quality of Service (QoS) for ATM emulated LANs
- Next Hop Routing Protocol (NHRP) support for reduction of routing hops
- AppleTalk routing support
- Support for RFC1483 bridging format
- Improved Broadcast Manager (BCM) for larger IPX networks
- Redundant ARP Server support
- Improved redundant IP gateway function

Descriptions of the Functions

The functions include ATM forum-compliant LAN emulation service, as well as IBM LAN emulation services; Classical IP over ATM; and standards-based bridging and routing support.

As a pioneer of ATM technology, IBM defined one of the early LAN Emulation architectures. Although IBM submitted this architecture to the ATM Forum, the final ATM Forum LAN Emulation Specifications diverged in a number of ways. Conse-

¹ J. Heinenen, "Multiprotocol Encapsulation over ATM Adaptation Layer 5," RFC 1483, Telecom Finland, July, 1993.

quently, IBM, like several other vendors, now has products that implement two different LAN Emulation architectures: some earlier products implement the IBM LAN Emulation Architecture, while other more recently developed products implement the ATM Forum LAN Emulation Specification. Although ATM Forum LAN Emulation is the strategic direction for multivendor interoperability, customers that have installed products implementing the IBM LAN Emulation Architecture must also be supported. These customers will generally fall into one of the following two categories: (1) customers who wish to continue using IBM LAN Emulation, which offers some technical advantages relative to the ATM Forum LAN Emulation, and (2) customers who wish to migrate to ATM Forum LAN Emulation. By adding a client for the IBM LAN Emulation Architecture, the MSS Server can provide routing and bridging services that support both purposes.

From routing and bridging perspectives, IBM LECs are functionally equivalent to ATM Forum LECs; both provide emulated Ethernet and Token-Ring interfaces with operational characteristics of real interfaces. You can configure a LEC to be either of these types:

- Ethernet-IBM
- Ethernet-Forum-Compliant
- Token-Ring-IBM
- Token-Ring-Forum-Compliant

ATM Forum-Compliant LAN Emulation Service

This function allows ATM networks to appear as LANs to provide a migration path to ATM that protects your investment in current LAN hardware and software. The MSS Server supports both Ethernet and token ring ELANs. Routable protocols such as IP and IPX and non-routable NetBIOS can both be run over ELANs.

By providing ATM Forum-compliant LAN emulation, the MSS Server offers you the opportunity to connect ATM devices with Ethernet or token-ring devices. You can protect your investment in LAN hardware and applications when you add an ATM backbone to your network. As your network expands, you can continue to add ATM devices and gradually migrate to ATM.

Emulated LANs are not based on physical topology (like existing shared-media LANs) but are, instead, logical groupings of end stations. Having the stations logically grouped allows much greater flexibility in handling moves, additions, and changes of the end stations.

Enhanced LAN Emulation Functions: In addition to ATM forum-compliant LAN emulation, IBM offers several enhanced LAN emulation features that improve network security, manageability, and performance.

Security: The MSS Server offers additional security when emulated LANs are established. The LAN emulation configuration server (LECS) can be used to check that a workstation that is attempting to join an ELAN belongs in that ELAN. This function helps to prevent unauthorized workstations from being admitted to an ELAN.

Redundancy: Through IBM extensions of LAN emulation, the MSS Server can support one backup (redundant) LAN emulation server on the same emulated LAN. This additional server must remain in a backup state until needed. It can be activated if the original MSS Server goes down. This system ensures that the network keeps running.

Performance—Enhanced LAN Emulation Broadcast Management: The broadcast management function is an IBM enhancement to LAN emulation. When explicitly enabled through configuration, BroadCast Manager (BCM) processes certain types of broadcast frames and, whenever possible, sends them only to interested LAN emulation clients and end stations. By reducing broadcast frames, BroadCast Manager reduces traffic on the network, reduces the overhead incurred on each end station, and thus enables better performance and scalability.

Manageability—BUS Monitor Monitor is a function in the MSS Server that provides a mechanism to pinpoint end-users who could be overutilizing the BUS. Such overuse may be due to faulty software or hardware, or may be intentional abuse of network resources. When enabled, BUS Monitor periodically samples the BUS traffic that occurs on a particular ELAN. At the end of each sample interval, the BUS Monitor identifies the top users of the BUS by their source MAC addresses, LEC ATM addresses, and the number of sampled frames each of them has sent to the BUS. This information can be retrieved using SNMP or the monitoring functions found in the command line interface and in the Web browser interface.

Classical IP over ATM: The MSS Server supports Classical IP over ATM as specified in RFC 1577. RFCs 1755 for signalling support and 1483 for packet encapsulation are also supported. ATM devices on the network are configured with IP subnet addresses as logical IP subnets (LISs). The MSS Server provides IP routing between the LISs.

Standards-Based Bridging and Routing Support: The MSS Server supports six bridging techniques (source route bridging, transparent bridging, source route transparent bridging, source route and transparent bridging, source route to transparent bridging, and adaptive source route transparent bridging).

The extensive IP routing implementation of the MSS Server includes OSPF, multicast support, BGP-4, and classless addressing in addition to basic IP support like ICMP, UDP, TCP, ARP, and RIP.

The MSS Server IPX routing support complies with the IPX Router Specification from Novell. IPX is supported over emulated LANs. Connection to other IPX routers is supported over ATM, as described in RFC 1483.

With its wide variety of bridging and routing support, the MSS Server protects your investments in existing networking equipment and provides a migration path to ATM. The bridging and routing support also allows emulated LANs to be partitioned for better manageability. The MSS Server can enable Ethernet and token-ring ELANs to communicate with one another and with Classical IP LISs. Using the MSS Server, you can create and manage a network composed of shared-media LANs, switched LANs, and ATM devices.

For a more detailed description of the functions of the MSS Server, refer to the *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference*.

SuperELAN Support

SuperELAN is a collection of emulated LANs that allows you to build large ATM networks. A client on any of the emulated LANs can establish a direct link, a data direct VCC, to any other client on the superELAN. In essence, the superELAN is emulating a standard ELAN, except that the LAN Emulation Server (LES) function is distributed throughout the ATM network. Reliability and performance of the LE services increase with the number of service entities. Resource utilization becomes less centralized, allowing for a much larger superELAN than a standard ELAN.

This distribution of LE services does not rely on a proprietary communications protocol between service entities. Instead, it is accomplished by an extension to transparent bridging called "Short-Cut Bridging." A *short cut bridge (SCB)* forwards certain LAN emulation control frames between SCB ports. Control frame forwarding allows client attached to distinct LESs to establish data direct VCCs to each other.

Two functions are added to SCB to complete the SuperELAN function; **Bridging Broadcast Manager (BBCM)** and **Dynamic Protocol VLANs (D-PVLANS)**. BBCM and D-PVLANS are added to control the broadcast traffic that would otherwise limit the effectiveness of a large emulated LAN. BBCM, like Broadcast Manager (BCM) in a single emulated LAN, resolves Layer 3 broadcasts into a Layer 2 unicast frame. D-PVLANS on the other hand, keeps track of what protocols and what subnets are on each of the LES domains. When BBCM is unable to resolve a broadcast, D-PVLANS forwards it only to those segments that are interested. D-PVLANS partitions the superELAN into protocol-specific ELANs.

In Release 1.1, SCB is for Transparent Bridging only. It will support both Token-Ring and Ethernet emulated LANs.

ATM Virtual Interfaces

Currently only 32 protocol addresses can be configured on any single interface. This function eliminates this limitation. When more protocol interfaces are needed on a physical interface, additional virtual interfaces can be defined on the physical interface. To the protocol support in the MSS Server, a virtual interface looks just like an additional adapter and 32 addresses can be assigned to each virtual interface.

This function can actually improve the performance in large complicated networks and will aid multicast routing protocols, such as OSPF.

BUS Performance

In LAN emulation, BUS performance determines the ability of ATM to forward frames for which a data direct VCC has not been established. Release 1.1 increases the number of frames forwarded to over 100Kpps in the standard BUS configuration.

FDDI to ATM Support

Release 1.1 adds support for dual ring fiber FDDI which allows you to route IP, IPX, and AppleTalk traffic between FDDI and ATM networks.

Quality of Service (QoS)

One of the advantages of ATM is the ability to negotiate **Quality of Service (QoS)**. Release 1.1 provides the ability to define a QoS for a LAN Emulation Client (LEC), and emulated LAN, or an ATM interface. This function is being delivered before the standards are finalized because many of our customers have requested it.

Next Hop Routing Protocol (NHRP) Support

Release 1.1 also provides one of the main functions of the expected Multiprotocol Over ATM (MPOA) standard—**Next Hop Routing Protocol (NHRP)**. This function allows NHRP clients to set up a data direct VCC and forward IP data frames without traversing immediate routers.

Enhanced Routing and Bridging Support

Release 1.1 provides **Routing support for AppleTalk** and **bridging support for RFC1483 bridge format frames**.

Redundant ARP Server Support

In Release 1.0, two MSS Servers could act as redundant ARP servers. However, it was not possible to designate which one was primary and which was secondary. Nor was it possible to switch back from the secondary to the primary when the primary returned online.

In Release 1.1 adds control that allows you to configure which MSS Server will act as the Primary ARP server, and which will act as the Secondary ARP server. If both MSS Servers are active, the primary will always be the one to service incoming calls.

Improved Redundant Default IP Gateway Function

This function allows end stations with manually configured default gateway IP addresses to continue passing traffic to other subnets after their primary gateway goes down. Without a backup gateway, an end station with a manually configured default gateway address is unable to send packets to other subnets until either the gateway comes up or the user changes the default gateway address.

MSS Server Hardware

There are two types of MSS Server: the (standalone) 8210 MSS Server, and the MSS Server Module, which can be installed in the 8260 Nways Multiprotocol Switching Hub, 8285 Nways ATM Workgroup Switch Expansion Unit.

Unless explicitly stated, the term *MSS Server* applies to both the 8210 MSS Server and the MSS Server Module.

The standalone version, 8210 MSS Server, is connected to the ATM network with 155-Mbps optical fiber cable that is attached to industry-standard SC connectors. See Appendix E, "8210 MSS Server Characteristics" on page E-1 for a description of physical and environmental characteristics, and pin assignments for the service port. The MSS Server Module is connected to the ATM network by installation in the 8260 Nways Multiprotocol Switching Hub or 8285 Nways ATM Workgroup Switch Expansion Unit.

For both the standalone and the blade, all the connectors and light-emitting diodes (LEDs) for the product are placed on the front.

Where to Go Next

Accessing the MSS Server

Because the MSS Server is remotely serviced, Chapter 2, “Accessing the MSS Server” on page 2-1 has information about accessing it.

Diagnosing Hardware Problems

Generally, errors that occur **before** the operational code is loaded are hardware-related. Light-emitting diodes (LEDs) on the front of the MSS Server are indicators of faults with hardware components within the MSS Server

Go to Appendix F, “8210 Nways MSS Server LED Indicators” on page F-1 for LED status and indicators for the 8210 MSS Server, or go to Appendix G, “MSS Server Module LED Status Indicators” on page G-1 for LED status and indicators for the MSS Server Module.

See Chapter 3, “Using Operational Diagnostics” on page 3-1 or Chapter 4, “Using MSS Server Firmware” on page 4-1 (depending on how you are connected to the MSS Server) to run hardware diagnostics **before** the MSS Server has been configured.

Diagnosing Operational Code and Configuration Problems

Generally, errors that occur **after** the operational code is loaded indicate problems with the operational code or configuration file.

Error codes and corrective action are described in *Event Logging System Messages Guide*, SC30-3682.

See Chapter 3, “Using Operational Diagnostics” on page 3-1 or Chapter 4, “Using MSS Server Firmware” on page 4-1 to run diagnostics **after** operational code and configuration files have been loaded. Also see Chapter 5, “Managing Operational Code and Configuration Files” on page 5-1.

Chapter 2. Accessing the MSS Server

This chapter explains how to access the MSS Server using a workstation.

Physical Access Methods

Before the MSS Server has been configured, it cannot yet function in the ATM network. Therefore, you have to access it in one of the following ways:

- Through a null modem cable attached to the EIA 232 service port. This is known as local connection.
- Through one of the PCMCIA modems, or through a modem attached to the EIA 232 service port. The PCMCIA modems are the Voice/Data/Fax PCMCIA Modem and the Data/Fax PCMCIA Modem. These are the forms of remote connection, which rely on the telephone lines.

You can set up both a local and a remote connection to the MSS Server. However, only one port can be active at any given time. If a workstation is connected locally to the serial port and a call comes in over the Voice/Data/Fax PCMCIA Modem or the Data/Fax PCMCIA Modem, priority is given to the call. After the call, the workstation will have to log back into the MSS Server.

With local or remote connection, you can use a teletypewriter (TTY) connection. TTY requires communications software to enable file transfer.

Alternatively, you can use Serial Line Internet Protocol (SLIP) over the local or remote connection. If you use SLIP, you must have Transmission Control Protocol/Internet Protocol (TCP/IP) running on your workstation.

You can continue to use local or remote access to the MSS Server after it has been configured. However, after configuration, you can also use Internet Protocol (IP) or LAN emulation to access the MSS Server through the ATM network. For the IBM 8210 Nways Multiprotocol Switched Services (MSS) Server, the connection is made over optical fiber from one of the ATM connectors; for the IBM Nways Multiprotocol Switched Services (MSS) Server Module, the connection is made through the ATM switch in which the module is installed.

Figures 2-1, 2-2, and 2-3 show local connection, remote connection using the PCMCIA modem, and connection over the network.

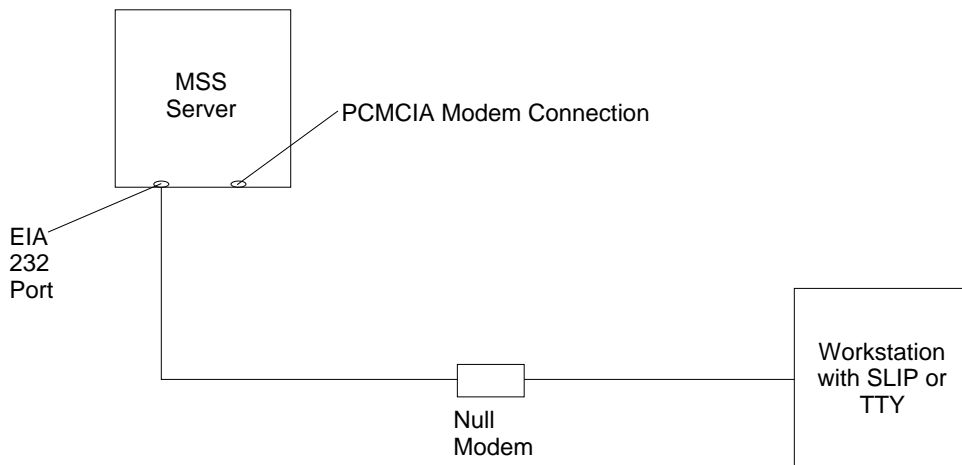


Figure 2-1. Local Serial Connection to the EIA 232 Port

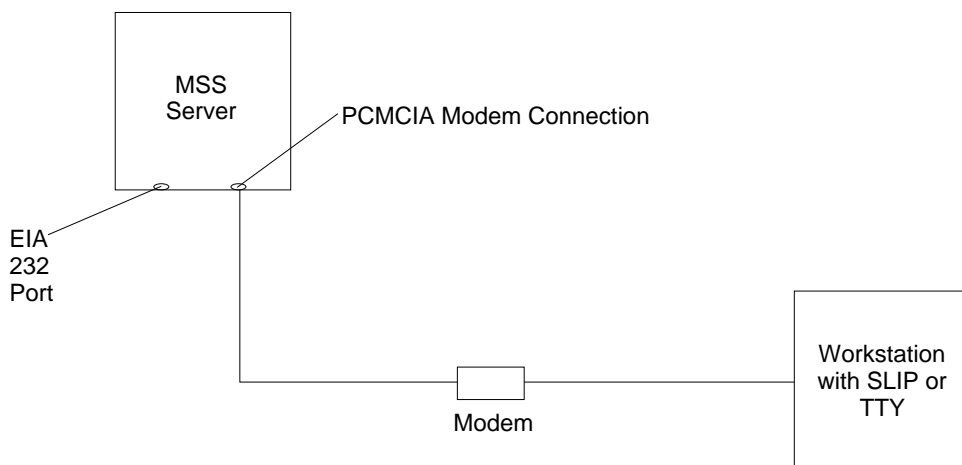


Figure 2-2. Remote Serial Connection to the PCMCIA Modem (Voice/Data/Fax PCMCIA Modem or Data/Fax PCMCIA Modem)

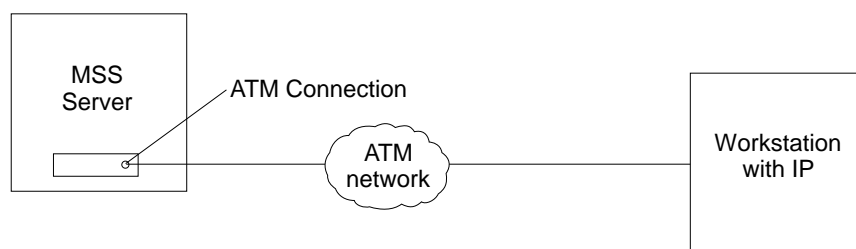


Figure 2-3. Connection Using IP Over the ATM Network. Shown with the server. The server or the module must be operational in the network to use this connection.

SLIP Addresses

To configure SLIP, use these addresses:

The IP address of the workstation

10.1.1.3

The IP address of the MSS Server

10.1.1.2

For instructions about installing SLIP, refer to the documentation for your version of TCP/IP.

Serial Port and Data/Fax PCMCIA Modem Default Settings

These are the default settings for the serial port:

Speed 19.2 Kbps

Parity None

Data Bits 8

Stop Bits 1

The Data/Fax PCMCIA Modem is a 28.8 bps V.32 bis modem. It is set up with a default speed of auto detect. The parity, data bits, and stop bits are the same as those of the serial port: None, 8, and 1.

Once the MSS Server operational code has loaded, the line speed for the serial port is automatically set to 9600 baud.

Configuration and Monitoring Tools

These are the various configuration and monitoring tools that are supported by the physical connections:

Multiprotocol Switched Services Configuration Program

This is a standalone program that is installed in a workstation that is connected to the MSS Server. The workstation must be running TCP/IP. You must use this program differently before and after the initial configuration of the MSS Server.

Before configuration:

Connection to the MSS Server must be through the modem or the service port, over a serial link. While the MSS Server is in this state, you cannot use the Communications options of the Configuration Program. You can create configuration files and download them to the MSS Server over the serial link using TFTP over SLIP. The workstation must be running TCP/IP.

After configuration

The configuration file that you download over a serial link can provide an IP address and subnet mask to the MSS Server, or establish LAN emulation. After you have configured the MSS Server and made it operational in the ATM network, you can access it through the network.

When the MSS Server is in this state, you can use the Communications Send option of the Configuration Program to send configuration files from the workstation over the network to the MSS Server. If you are using the version of the Configuration Program that is supported by AIX, you can also use the

Communications Retrieve option of the Configuration Program to retrieve configuration files from the MSS Server.

Web browser Hypertext Markup Language (HTML) interface

The Web browser interface is a configurator that is a home page and is accessed by a Web browser from a workstation that is connected to the MSS Server. You need a Web browser that can display clickable images and tables. The Web browser interface can be accessed using SLIP or IP. You must use the serial line connection and SLIP before the MSS Server is operational in the network.

If you give the Web browser the SLIP address, one of the configured IP addresses of the MSS Server, or its name (if you use an IP name server), the Web browser interface will come up.

Note: The configured IP addresses of the MSS Server include the IP addresses of all the LAN emulation servers and Classical IP clients.

Command line interface

The command line interface is a teletypewriter (TTY) text interface that requires you to enter commands to use it. The workstation that accesses it must be either an ASCII terminal or a personal computer (PC) or other intelligent programmable workstation emulating an ASCII terminal.

This interface must be reached over a serial link before the MSS Server is operational in the network; you can use TTY or SLIP to access it. If you use SLIP, you can Telnet into the MSS Server.

After the MSS Server is operational in the ATM network, you can Telnet into the MSS Server over IP to bring up this interface. If one connection to the MSS Server is a Telnet session, the MSS Server can support two connections at one time.

The command line interface is marked by an asterisk (*) prompt. Refer to the *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for a full description of this interface.

Important: If you use a serial connection, (either local or remote), you **must press a key** to bring up the asterisk that is the prompt for the command line interface. When you make the connection, the message Please press a key to obtain console appears and reminds you to do this.

Voice/Data/Fax PCMCIA Modem or Data/Fax PCMCIA Modem

The Voice/Data/Fax PCMCIA Modem is an integrated modem with both voice and fax capabilities that is shipped with the MSS Server in the U.S. and Canada. It provides access using touch tone telephone input with automated voice responses. In addition to faxing an alert after the MSS Server has had a failure and has restarted, it can fax other reports that monitor the MSS Server and it can change a few dynamic parameters that help to maintain the MSS Server in the network.

The Data/Fax PCMCIA Modem is an integrated PCMCIA modem that handles data and can fax an alert from the MSS Server. For example, it can fax an alert from the MSS Server if the MSS Server has had a failure and has then automatically restarted.

Both of these modems provide full text console access to the command line interface. They provide remote connection that supports either the TTY or SLIP access. The Voice/Data/Fax PCMCIA Modem provides access using

| the voice interface to several configuration parameters, including enabling or
| disabling thermal shutdown for the standalone server only.

| **Fax Accumulation**

| If several undeliverable faxes are sent from the Voice/Data/Fax interface, they will
| not be deleted. They will accumulate as new faxes are added and sent when possible.
| The most common cause of fax delivery failure is a missing or incorrect fax
| telephone number.

| **Local and Remote Console Access**

| When accessing the MSS Server locally on a null modem cable attached to the EIA
| service port or remotely through the PCMCIA modem, use VT100 terminal emulation.
| Because VT100 does not define function keys above F4, edit the keyboard
| mapping manually as follows: For F6, enter the mapping (ESC)OU. For F9, enter
| the mapping (ESC)(Left square bracket)009q.

| **Note:** (ESC) represents the carat symbol followed by the left square bracket.

| Also note that a PING done on the PCMCIA modem may take up to 2
| minutes.

| **Remote Voice Access**

| When dialing the number for voice access to the MSS Server, detection of the user
| is not automatic. The user will be asked to press the # key. If the user fails to do
| this, the server assumes the caller is a modem and will subsequently send a carrier
| signal. If the # key is pressed, operation proceeds.

| **Note:** At this point, the functions offered by the Voice/Data/Fax PCMCIA Modem
| are the same as certain functions that you can access using the command line
| interface. Refer to the *IBM Multiprotocol Switched Services (MSS) Command Line
| Interface Volume 1: User's Guide and Protocol Reference* for more information
| about these functions.

Chapter 3. Using Operational Diagnostics

Operational diagnostics for the MSS Server can be invoked through either the HTML interface or the command line interface. If the MSS Server is not configured (booted up and in config only mode), operational diagnostics cannot be invoked. The preferred access method is the HTML interface and it is recommended if you are able to access the MSS Server through Telnet. You should use the command line interface in any one of the following situations: (1) you are using a workstation attached to the Service port (serial port) of the MSS Server, (2) you dialed in through a modem and your workstation does not support SLIP, or (3) you do not have a web browser.

The content of the HTML interface diagnostics panels is similar to that of the command line interface. Words and choices are the same, only the methods you use to make your selections differ. Point and click to make your selections if you are using the HTML interface. Selections for the command line interface are numbered and enclosed in the less than symbol (<) and the greater than symbol (>) (for example, <1. View Device Status>). Type in the number of your choice and press **Enter** to make a selection. At any time press **E** and **Enter** to return to the command line interface top level prompt (*).

Chapter 2, "Accessing the MSS Server" on page 2-1 discusses what is required to access the MSS Server. General procedures for invoking Operational Diagnostics are described as follows in this section.

Using the HTML Interface Operational Diagnostics

If you access the MSS Server through the HTML interface:

- 1** Ensure that SLIP is configured in your workstation. The default SLIP address for the workstation is 10.1.1.3 and the default SLIP address for the MSS Server is 10.1.1.2.
- 2** Open your web browser and give it the SLIP address of the MSS Server. The MSS Server Home Page will appear (Figure 3-1 on page 3-2).

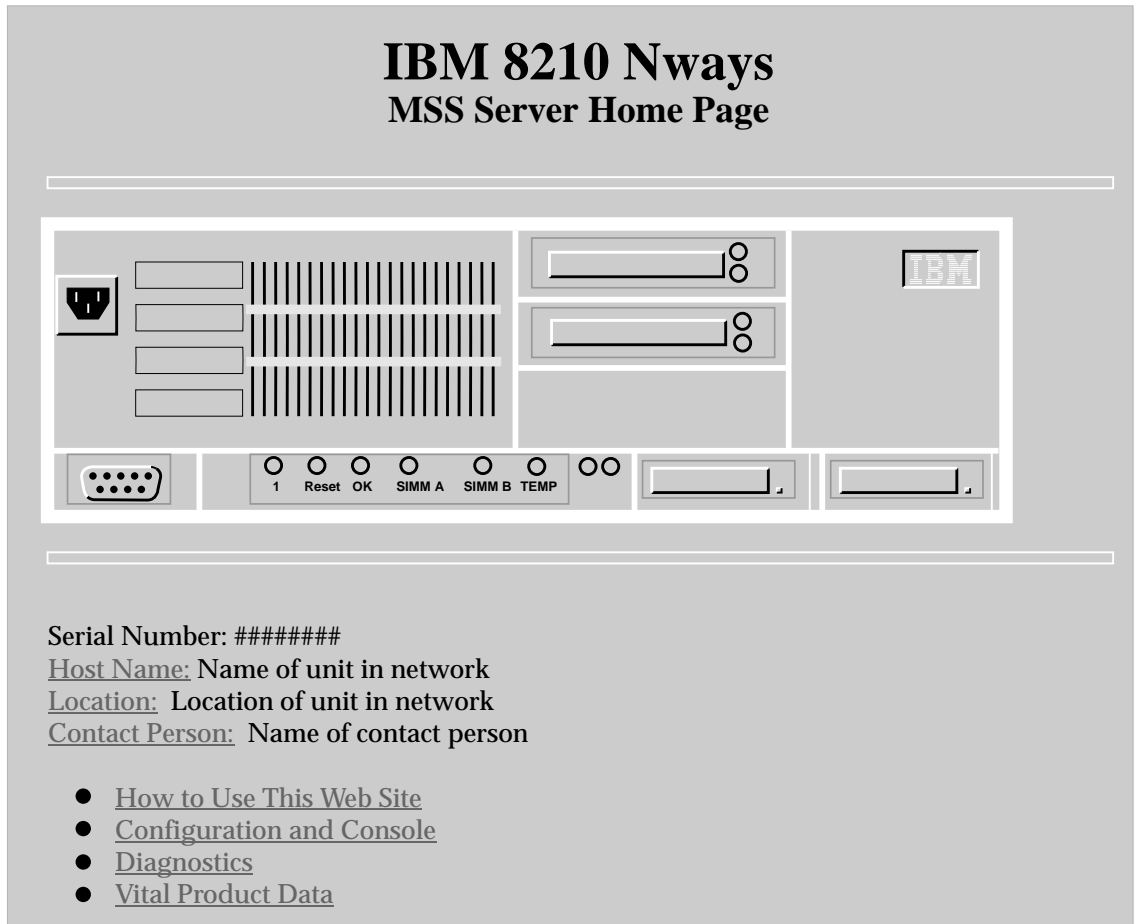


Figure 3-1. MSS Server Home Page

3 Select **Diagnostics**. The Diagnostics Menu will appear (Figure 3-2).

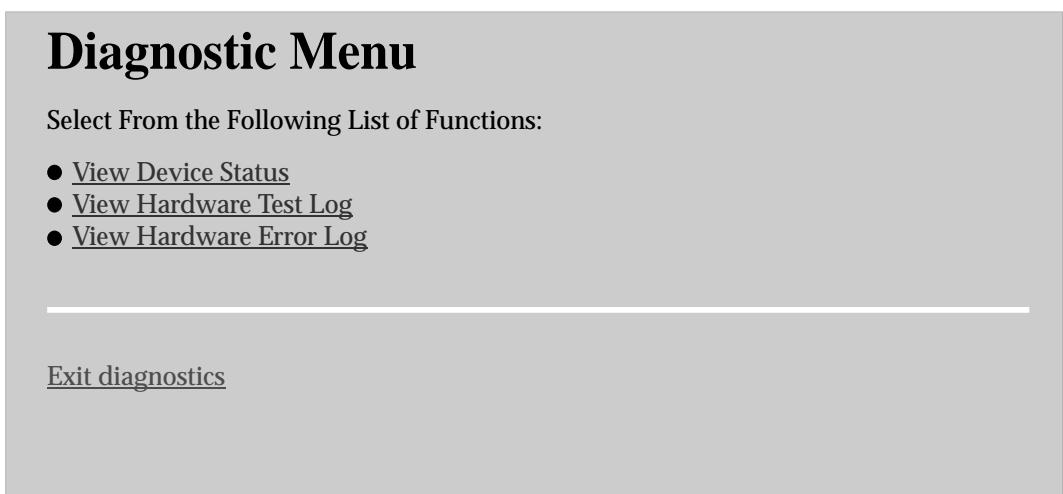


Figure 3-2. HTML Interface Diagnostics Menu

Select **View Device Status** and continue to point and click on your choices to test the ATM devices in the MSS Server, to enable or disable a device, and to view hardware test or error log data.

- 4 When you have finished running diagnostics, close by clicking **Exit Diagnostics** on the Diagnostics Menu.

Using the Command Line Interface Operational Diagnostics

If you access the MSS Server through the command line interface :

- 1 At the asterisk (*), type **diags** and press **Enter**.
- 2 The Diagnostics Menu appears (Figure 3-3). To make your selection, type in the number of your choice and press **Enter**.

```
DIAGNOSTICS MENU

Select from the following;

<1. View Device Status>
<2. View Hardware Test Log>
<3. View Hardware Error Log>

-----
<4. Diagnostics>

Select 1-4 or (E)xit:
```

Figure 3-3. Operational Diagnostics Main Menu

Check the status of the ATM adapters in the MSS Server by selecting **<1. View Device Status>**.

To check the contents of the test log, select **<2. View Hardware Test Log>**, or to see entries in the error log, select **<3. View Hardware Error Log>**.

Additional panels are displayed based on your selections. For example, if you select **<1. View Device Status>**, the Device Status panel (Figure 3-4 on page 3-4) appears.

```

Please Wait...

                                DEVICE STATUS

For more Information and Test Control...
Select from the following Devices:

   Device   Location   ID       Operation   Diagnostics   Network
   HDrive   Socket 0   PCMCIA 1   ENABLED     INACTIVE      UNKNOWN
<1.ATM Ifc>                NET#0     ENABLED     INACTIVE      UP

-----
<2.Diagnostics Menu> - <3.Refresh>

Select 1-3 or (E)xit:

```

Figure 3-4. Device Status Panel

3 If you select <1. ATM Ifc> (on the Device Status panel), a Test Control panel appears (Figure 3-5).

```

155Mb/s ATM over multi-mode fiber - Slot 1 - Net#0

                                TEST CONTROL

                                Operation   Diagnostics   Fault Status   Network Connection
                                ENABLED     ACTIVE        OK              UP

<1. View Device Status>
<2. View Hardware Test Log>
<3. View Hardware Error Log>

-----
<4.Diagnostics Menu> - <5.Device Status> - <6.Refresh>

Select 1-3 or (E)xit:

```

Figure 3-5. Test Control Panel (Device Enabled)

The content of the Test Control Panel is dynamically built and displayed depending on the state of the device (that is, whether it is enabled or disabled).

If a device is enabled, the content of the Test Control panel would appear as in Figure 3-5.

If a device is disabled, the content of the Test Control panel would appear as in Figure 3-6 on page 3-5.


```

                                TEST CONTROL

                                Operation  Diagnostics  Fault Status  Network Connection
                                DISABLED  INACTIVE      NETWORK       DOWN

Select from the following;

<1. Enable Device>
<2. Run Default Test>
<3. Test Until Error>
<4. Loop and Log>
<5. View Hardware Test Log>
<6. View Hardware Error Log>

-----
<7.Diagnostics> - <8.Device Status> - <9.Refresh>

```

Figure 3-6. Test Control Panel (Device Disabled)

Note: You must disable a device before you test it. When on the Test Control panel and if the status for the device is Enabled, you can disable the device by selecting the Disable option. Once the test is complete, enable the device before exiting the diagnostics utility.

Always select **Refresh** to ensure a test is stopped before enabling a device.

4 From this Test Control panel, you can select one of the following options:

<1. Enable Device>

to enable an ATM adapter.

<2. Run Default Test>

to execute the default diagnostics for the ATM adapter.

<3. Test Until Error>

to execute diagnostics on an ATM adapter until an error is detected or you stop the test.

<4. Loop and Log>

to execute diagnostics on an ATM adapter and log the errors detected. Select stop test to stop the diagnostics.

<5. View Hardware Test Log>

to display start/stop times of all operational diagnostics.

<6. View Hardware Error Log>

to display hardware error messages produced by operational diagnostics.

5 Press **E** and **Enter** to return to the command line interface prompt (*).

Chapter 4. Using MSS Server Firmware

The MSS Server contains firmware. This firmware tests the hardware each time the MSS Server is powered on. If the MSS Server has not loaded its operational code, the firmware should be running. The firmware can come up and pause when the MSS Server is set up to boot up in "Attended Mode." Attended Mode requires direct intervention from console input to complete the boot-up process. Attended mode can be configured from the **Talk 6** command set or from the Firmware command set.

Important:

1. You can also access the firmware by stopping the boot process. To do this, you must have a TTY console directly attached to the serial port. When the MSS Server starts its boot process, press and hold **Ctrl-C** at the terminal keyboard.
2. If the firmware screens do not appear after you complete the above step:
 - a. Be sure your workstation is connected to the serial port on the MSS Server
 - b. Restart or power down and power up the MSS Server.

Attended Mode

When the MSS Server is configured to come up in Attended mode, you are given access to the Firmware command set. From this level of commands, you can select the Image Bank from which to load. You can also choose the config file from within that Image Bank. At this point, you can load new config files or image files.

Connection in attended mode is either a TTY or Telnet connection. You can transfer files using the Xmodem protocol for TTY or TFTP for IP connections.

In Attended mode, you can start booting the MSS Server by pressing **F9** or **<Esc>9** to start the operating system.

Unattended Mode

This is the normal mode for the MSS Server.

Reference Information

The following manuals contain information that may be helpful when diagnosing and fixing a hardware problem:

8210 Nways Multiprotocol Switched Services (MSS) Server Setup and Problem Determination Guide, GA27-4140.

Nways Multiprotocol Switched Services Server (MSS) Module Setup and Problem Determination Guide, GA27-4141.

Starting MSS Server Firmware

You are ready to begin using the information in this chapter after you have prepared your service terminal (as described in Chapter 2, "Accessing the MSS Server" on page 2-1) and have established connection with the MSS Server.

From the Main Menu panel (as shown in Figure 4-1), you can select from four services. The following sections explain these services and provide instructions for going through the associated panels:

- "Managing the Configuration" on page 4-4.
- "Selecting the Boot Sequence" on page 4-5.
- "Selecting a Device To Test" on page 4-6.
- "Using the Utilities" on page 4-8.

```
IBM MSS Server Firmware
Version 1.0
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                        System Management Services

Select one:
  1. Manage Configuration
  2. Boot Sequence Selection
  3. Select Device to Test
  4. Utilities

Enter   -   Esc=Quit   -   F1=Help   -   F3=Reboot   -   F9=Start OS -
-----  -   -         -   -         -   -         -   -         -   -         -
```

Figure 4-1. Main Menu Panel

Understanding the Function Keys

As seen in Figure 4-1 on page 4-2, various function keys appear at the lower part of panels. These keys are common among the MSS Server Firmware panels. On other panels the functions keys are stacked at the right of the panel. Use the F1 Help key to get descriptions for the function keys associated with the MSS Server Firmware.

Obtaining Help

Online helps are available for panels whenever the F1 key is displayed at the lower portion of the panel. Pressing F1 presents a pop-up help window with information relating to the currently active panel.

Managing the Configuration

Managing the configuration involves defining and changing some configuration values. You can change the operational parameters for the serial ports. For example, you could modify the serial ports or PCMCIA modem's speed, parity, data bits, and so on, by pressing the F6 Modify key.

- 1** Select **1. Manage Configuration** from the main menu as shown in Figure 4-1 on page 4-2.
- 2** The System Configuration Information panel is displayed as shown in Figure 4-2.
Note: Only the fields under Serial Ports can be changed (modified).
- 3** To change the specifications for a port, move the cursor to the field, press **F6**, and type in the new value.
- 4** Press **Enter** to make the change effective.

```
IBM MSS Server Firmware
Version 1.0
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System Management Services
+-----System Configuration Information-----+
Select one | Processor Data      Type 603E
1. Manag  | Memory             16 Megabytes  >
2. Boot   |
3. Selec | PCI Slots
4. Utili |   Name of adapter  Slot #      Device ID   Revision ID
          |   IBM 060100      1           000a       03
          |
          | 512KB L2 Cache    Installed
          |
          | Serial Ports
          |   COM1 (x' 8c0')  Serial Port
          |   COM2 (x' 2f8')  PCMCIA Modem
          |
Enter      | Enter - Esc=Quit  - F1=Help  - F6=Modify -
-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+
```

Figure 4-2. System Configuration Information

Selecting the Boot Sequence

This function enables you to select a sequence for the several boot devices, display the current boot device settings, restore the default setting, and boot from other boot devices.

To select a boot sequence:

- 1** Select **2. Boot Sequence Selection** from the main menu.
- 2** The Boot Sequence Selection panel is displayed as shown in Figure 4-3.

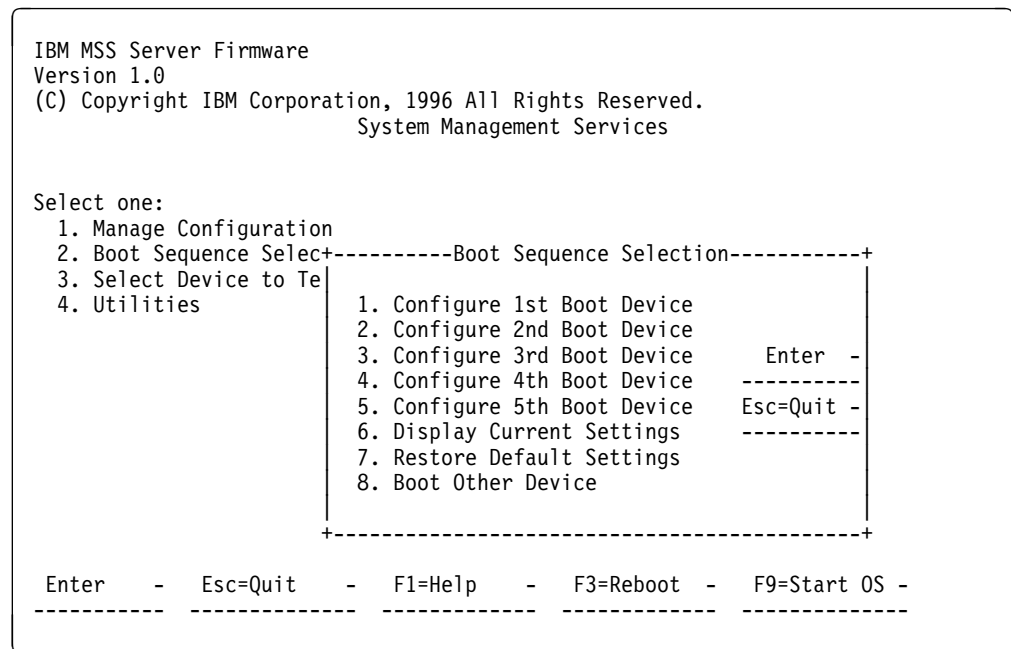


Figure 4-3. Boot Sequence Selection Panel

- 3** Selecting choices 1 through 5 causes a Boot Device Selection panel to be displayed. Highlight your choice and press the **Enter** key to make your device selection. Defaults boot devices are:
 - Onboard Flash is first (1st) boot device.
 - Hard drive is the second (2nd) boot device.
 - SLIP using the PCMCIA modem is the third (3rd) boot device.
 - SLIP using an external modem is the fourth (4th) boot device.
- 4** Repeat Step 3 to select as many boot devices as you want to define.
- 5** Press F3 to reboot the MSS Server to have your boot device change effective.
- 6** If you want to restore your current defaults, select 7. Restore Default Settings from the Boot Sequence Selection panel before you reboot the MSS Server and your default boot device settings will be restored.

4 Move the cursor to a selection and press **F4** to define additional test parameters.

5 The Test Parameters panel is displayed. From this panel you can select:

- Run Interactive Test
- Run Wrap Tests
- Stop On Error
- Loop Tests
- Loop Count

Press **Esc** to return to the Select Device Test panel.

6 Press **F6** to start a test.

7 After the test is complete, press **Esc** to return to the main menu panel.

Using the Utilities

The individual utilities are self-explanatory and are displayed on a panel after you have indicated you want to use the utilities on the main menu panel.

- 1** Select **4. Utilities** from the main menu.
- 2** A panel listing the available utilities is displayed (Figure 4-5).

```
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                        System Management Services

Select one:
 1. Set Supervisory Password
 2. Enable Unattended Start Mode
 3. Disable Unattended Start Mode
 4. Remove Supervisory Password
 5. Update System Firmware
 6. Display Error Log
 7. View or Set Vital Product Data
 8. Copy Remote Files
 9. Remote Initial Program Load Setup
10. Manipulate Dead Man Timer
11. Display Event Log
12. Change Management

Enter   -   Esc=Quit   -   F1=Help   -
-----  -----  -----
```

Figure 4-5. Utilities Selection Panel

- 3** Make your selection. Additional panels will be displayed to prompt you for additional information, and messages are displayed to indicate that the task was performed.

Setting the Supervisory Password

You must set a supervisory password before operational code can be loaded in the MSS Server, The MSS Server is initially shipped with a password of **mss**. This utility allows you to set and change the password.

- 1** Select **1. Set Supervisory Password** from the utilities panel. The Set Supervisory Password panel is displayed (Figure 4-6).
- 2** Type your new password and press **Enter**. You are prompted to enter your new password again.

Note: The supervisory password can consist of from 1 to 8 characters with no restrictions on which characters can be used.

```
IBM MSS Server Firmware
Version 1.0
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      System Management Services

Select one:
1. Set Supervisor+-----Set Supervisory Password-----+
2. Enable Unatten|
3. Disable Unatte| Type your new password, and then
4. Remove Supervi| press Enter.
5. Update System  |
6. Display Error  |
7. View or Set Vi | Enter - F1=Help -
8. Copy Remote Fi| -----
9. Remote Initial+-----+
10. Manipulate Dead Man Timer
11. Display Event Log
12. Change Management

Enter - Esc=Quit - F1=Help -
-----
```

Figure 4-6. Set Supervisory Password Panel

- 3** Type the password again and press **Enter**.
- 4** The Password Saved panel is displayed with the message that your supervisory password has been saved.

Enabling Unattended Start Mode

The default is that unattended start mode is enabled, which causes the MSS Server to load operational code automatically.

- 1** Select **2. Enable Unattended Start Mode** from the utilities panel.
- 2** The Unattended Start Mode Changed panel is displayed (Figure 4-7). Press **Enter**.

```
IBM MSS Server Firmware
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      System Management Services

Select one:
 1. Set Supervisory Password
 2. Enable Unatten+-----Unattended Start Mode Changed-----+
 3. Disable Unatte|
 4. Remove Supervi|      Unattended start mode has been
 5. Update System  |      enabled.
 6. Display Error  |
 7. View or Set Vi |      Enter  -
 8. Copy Remote Fi|      -----
 9. Remove Initial+-----+
10. Manipulate Dead Man Timer
11. Display Event Log
12. Change Management

Enter  -   Esc=Quit  -   F1=Help  -
-----  -----  -----
```

Figure 4-7. Unattended Start Mode Changed (Enabled) Panel

Note: Once unattended start mode has been enabled, the firmware can be entered by pressing and holding **Ctrl-C** at the terminal keyboard when the boot process begins.

Disabling Unattended Start Mode

The default for the MSS Server firmware is that the unattended start mode is enabled. You disable Unattended Start Mode using this utility.

- 1** Select **3. Disable Unattended Start Mode** from the utilities panel.
- 2** The Unattended Start Mode Changed panel is displayed (Figure 4-8). Press **Enter**.
- 3** This panel informs you that the unattended start mode has been disabled and prompts you to press Enter.

```
IBM MSS Server Firmware
Version 1.0
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                        System Management Services

Select one:
 1. Set Supervisor Password
 2. Enable Unattended Start Mode
 3. Disable Unatte+-----Unattended Start Mode Changed-----+
 4. Remove Supervi |
 5. Update System   |      Unattended start mode has been
 6. Display Error   |      disabled.
 7. View or Set Vi  |
 8. Copy Remote Fi |      Enter -
 9. Remote Initial |      -----
10. Manipulate Dea+-----+
11. Display Event Log
12. Change Management

Enter - Esc=Quit - F1=Help -
-----
```

Figure 4-8. Unattended Start Mode Changed (Disabled) Panel

Removing Supervisory Password

The use of a supervisory password allows you a degree of security by preventing unauthorized access to the MSS Server. Removing the enforcement of a password however could be a convenience while servicing the MSS Server.

- 1** Select **4. Remove Supervisory Password** from the utilities panel.
- 2** The Remove Supervisory Password panel is displayed (Figure 4-9).

```
IBM MSS Server Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
      System Management Services

Select one:
  1. Set Supervisory Password
  2. Enable Unattended Start Mode
  3. Disable Unattended Start Mode-----Remove Supervisory Password-----+
  4. Remove Supervisory Password
  5. Update System
  6. Display Error
  7. View or Set Variables
  8. Copy Remote File
  9. Remote Initial
 10. Manipulate Device-----+
 11. Display Event Log
 12. Change Management

Do you want to remove the
Supervisory password?
  Yes  -   No  -
-----  -----

Enter   -   Esc=Quit   -   F1=Help   -
-----  -----  -----  -----
```

Figure 4-9. Remove Supervisory Password Panel

- 3** Select **Yes** if you want to remove the supervisory password. Press **Enter**.
- 4** The Password Removed panel is displayed. This panel informs you that the supervisory password has been removed.

Updating System Firmware

Use this utility to update the MSS Server firmware. Only full images of the firmware are shipped; therefore, when you select this option you completely replace the previous level of firmware.

Note: Its important that the MSS Server not be powered off or reset during this process. If the update fails, the MSS Server will boot a backup firmware image. If this happens, repeat the update procedure to reload the onboard firmware image.

1 Select **5. Update System Firmware** from the utilities panel.

2 The System Firmware Update panel is displayed (Figure 4-10).

```
IBM MSS Server Firmware
Version 1.0
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                        System Management Services

Select one:
 1. Set Supervisory Password
 2. Enable Unattended Start Mode
 3. Disable Unattended Start Mode
 4. Remove Supervisory Password
 5. Update System +-----System Firmware Update-----+
 6. Display Error |
 7. View or Set Vi | This selection will update your
 8. Copy Remote Fi | system firmware. Do you want to
 9. Remote Initial | continue?
10. Manipulate Dea |
11. Display Event | Yes - No -
12. Change Managem | -----
                    +-----+

Enter - Esc=Quit - F1=Help -
-----
```

Figure 4-10. Update System Firmware Panel

3 Select **Yes** if you want to update the firmware, The firmware update process begins. It informs you that the system firmware has been updated.

Attention: Do not power off the MSS Server during the process of updating the firmware.

Displaying the Error Log

The error log is resident in NVRAM (not on the hard drive). See Appendix D, "Firmware Error Codes" on page D-1 to interpret the data that appears in the Error Code field.

1 Select **6. Display Error Log** from the utilities panel.

2 The Error Log panel is displayed (Figure 4-11).

```
IBM MSS Server Firmware
Version 1.0
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      System Management Services

Select one:
  1. Set Supervisory Password
  2. Enable Unattended Start Mode
  3. Disable Unattended Start Mode
  4. Remove Supervisory Password
  5. Update System Firmware
  6. Display Error Log
  7. View
  8. Copy
  9. Remove
 10. Manage
 11. Display
 12. Channel

-----Error Log-----+
|      Date      Time   Error Code  Location  |
| Entry 1 02/19/96 10:07:51 00016000 System Board |
| Entry 2                no error logged                |
|      Esc=Quit -   F1=Help -   F6=Clear Error Log -   |
|-----+-----+-----+-----+-----+-----+
Enter - Esc=Quit - F1=Help -
-----+-----+-----+-----+-----+-----+-----+

```

Figure 4-11. Error Log Panel

3 The Error Log panel is displayed. See Appendix D, "Firmware Error Codes" on page D-1 for an explanation of the data that appears in the Error Codes field.

The Location field can contain any of the following entries:

- PCMCIA hard drive
- PCMCIA modem
- ATM adapter Port 1
- ATM adapter Port 2
- System Board

- NA - Burned in MAC Address in ASCII Format
- ZB - Burned in MAC Address in Hex Canonical Format
- TM - Machine type and model
- F# - Feature Number
- BS - Box serial number
- RC - Recycle count
- Z0 - Vendor ID

Copying Remote Files

This utility allows you to copy remote files from another machine into memory or into the hard file. There are two methods of file transfer: TFTP from a server using SLIP, or Xmodem over one of the serial ports. A virtual RAM disk is automatically created with a size of 600 000 bytes for storing files in memory. Files can also be stored to the hard file by appending `c:\` to the local file name.

- 1** Select **8. Copy Remote Files** from the utilities panel.
- 2** The Copy Remote Files panel is displayed (Figure 4-12 on page 4-15). From this panel you select the method of file transfer. Subsequent panels allow you to enter the names of the files you want to copy.

```
IBM MSS Server Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
                        System Management Services

Select one:
 1. Set Supervisory Password
 2. Enable Unattended Start Mode
 3. Disable Unattended Start Mode
 4. Remove Supervisory Password
 5. Update System Firmware
 6. Display Error Log
 7. View or Set Vital Product Data
 8. Copy Remote Files      +----- Copy Remote Files-----+
 9. Remote Initial Program L|
10. Manipulate Dead Man Time| 1. TFTP a Remote File
11. Display Event Log      | 2. Xmodem a Remote File
12. Change Management      |
                             |
                             | Enter - Esc=Quit - F1=Help -
                             |-----|
-----|-----+-----|-----+
```

Figure 4-13. Copy Remote Files Panel

Setting Up Remote Initial Program Load

Before you can configure an MSS Server in the network, it must have an IP address that is recognized within your network and it must have the addresses of your ATM adapters. Use this utility to dial in with a BOOTP server.

This utility allows you to load this minimum information to install this device in your network so that you can send it a configuration file, or otherwise communicate with it. This utility allows you to Ping the MSS Server, after loading its minimum network parameters, to see if you can communicate with it.

- 1** Select **9. Remote Initial Program Load Setup** from the utilities panel.
- 2** The Network Parameters panel is displayed (Figure 4-14). From this panel you can select to enter the IP address of the MSS Server, input PCMCIA adapter parameters, or Ping the MSS Server.

```
IBM MSS Server Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
                        System Management Services

Select one:
 1. Set Supervisory Password+----- Network Parameters -----+
 2. Enable Unattended Start
 3. Disable Unattended Start
 4. Remove Supervisory Passw
 5. Update System Firmware
 6. Display Error Log
 7. View or Set Vital Produc
 8. Copy Remote Files
 9. Remote Initial Program L
10. Manipulate Dead Man Time+-----+
11. Display Event Log
12. Change Management

                                1. IP Parameters
                                2. PCMCIA Adapter Parameters
                                3. Ping

                                Enter - Esc=Quit - F1=Help -

-----
```

Figure 4-14. Setup Remote Initial Program Load Panel

- If you select **IP Parameters**, you will be presented a panel on which you can enter:
 - Client IP Address (the IP address of the MSS Server)
 - Server IP Address
 - Gateway IP Address
 - Subnet Mask

A MSS Server comes from the factory with the following default IP addresses:

Client	111.11.11.11
Server	111.11.11.10
Gateway	111.11.11.10
Subnet mask	255.255.255.0

- The **PCMCIA Adapter Parameters** option is not available for Release 1.0 of the MSS product.

3 The **Ping** option allows you to test connectivity.

Note: Do not Ping your current terminal connection.

Display Event Log

This utility allows you to display the contents of the event log, which records events that happen during the boot sequence before the operational code can log errors.

- 1** Select **11. Display Event Log** from the utilities panel.
- 2** An Event Log panel is displayed. From this panel you can identify the events that have been logged. Each event has an Event Type field, an Action Type, and possibly a text description.

```
IBM MSS Server Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
                        System Management Services

Select one:
  1. Set Supervisory Password
  2. Enable Unattended Start Mode
  3. Disable Unattended Start Mode
  4. Remove Supervisory Password
  5. Update System Firmware
  6. Display Error Log
  7. View or Set Vital Product Data
  8. Copy Remote Files
  9. Remote Initial Program L
 10. Manipulate Dead Man Timer
 11. Display Ev+-----Event Log-----+
 12. Change Man|   Event Type   Action Code   Informaton
                |-----|-----|
Enter   -   E |
-----  -- |
                +-----+-----+-----+
```

Figure 4-16. Event Log Panel

Xmodem Software Selection in Change Management

See Chapter 5, “Managing Operational Code and Configuration Files” for more information about change management.

Xmodem is supported only from the Firmware prompt. To access the Firmware prompt, you have either to interrupt the boot-up sequence or bring up the MSS Server in Attended mode. The Change Management command is available from the Firmware Utilities option of the Main Menu. From that point, the MSS Server will direct you as to what to transfer in and where to put the image.

Note: When the MSS Server is in firmware mode, there is no Active configuration or image. Therefore, you should use caution when specifying where to write new images or configurations.

Included below are sample menus associated with Xmodem download. These screens show the text that is displayed when you choose Xmodem Software from the Change Management command.

Example:

IBM MSS Server Firmware
Version 1.0
(C) Copyright IBM Corporation, 1996 All Rights Reserved.
System Management Services

MSS Software Control		
BankA	Description	Date
IMAGE - NONE		
CONFIG 1 - AVAIL	test config for pubs	01 Jan 1970 00:01
CONFIG 2 - AVAIL *	test config for pubs	01 Jan 1970 01:13
CONFIG 3 - NONE		01 Jan 1970 00:58
CONFIG 4 - AVAIL		01 Jan 1970 00:14
BankB	Description	Date
IMAGE - ACTIVE		01 Jan 1970
CONFIG 1 - AVAIL	test config for pubs	01 Jan 1970 00:54
CONFIG 2 - AVAIL		01 Jan 1970 00:01
CONFIG 3 - AVAIL		01 Jan 1970 00:14
CONFIG 4 - ACTIVE *		01 Jan 1970 00:24
BankF	Description	Date
IMAGE - AVAIL		01 Jan 1970
CONFIG 1 - AVAIL	test config for pubs	01 Jan 1970 00:54
CONFIG 2 - AVAIL		01 Jan 1970 00:01
CONFIG 3 - AVAIL		01 Jan 1970 00:14
CONFIG 4 - ACTIVE *		01 Jan 1970 00:24

Enter - Esc=Quit - F1=Help -

Chapter 5. Managing Operational Code and Configuration Files

This chapter explains how to manage the operational code images and configuration files.

Initial Configuration

After the MSS Server has passed its hardware diagnostics, it is in a ready state for configuration. These are two examples of ways to complete the first configuration:

First Example

1. Use the Configuration Program to create a binary configuration file.
2. Download the file to the MSS Server using TFTP over SLIP.
3. Restart the MSS Server to make the configuration active. If your configuration file included all the necessary parameters, the MSS Server should now be completely operational in the network.

Second Example

1. Use a SLIP or a TTY connection over a serial link to access the MSS Server.
2. Bring up the Web browser interface or the command line interface.
3. Use quick configuration to do a minimal configuration of the MSS Server, including IP address and SNMP. See "Quick Configuration" on page 5-2.
4. Restart the MSS Server to activate the quick configuration.
5. Next, make and save a configuration file using the Configuration Program. Use either the TFTP Get command over SLIP or IP or use the Communications Options Send command of the Configuration Program to download the configuration file.

If you use TFTP, you must use the Create option of the Configuration Program to create binary files and then TFTP them to the MSS Server.

6. Restart the MSS Server to make the configuration active. If your configuration file included all the necessary parameters, the MSS Server should now be completely operational in the network.

Tips for Managing Configuration Problems

Important: After the MSS Server is configured and operational, *always* back up the active configuration file. Keeping this file enables you to re-establish the MSS Server on the network should the active configuration become corrupted.

You can back up the active configuration file by retrieving it and storing it in the workstation. See "File Transfer" on page 5-8 for more information.

Reconfiguring

You can find it hard to detect problems caused by configuration errors. A configuration error can initially appear to be a hardware problem because the MSS Server will not start or data will not flow through a port. In addition, problems with configuration may not result in an error initially; an error may occur only when specific conditions are encountered or when heavy network traffic occurs.

If you cannot resolve a problem after making a few changes to your configuration or after restoring the active configuration file, it is recommended that you generate a new configuration. Too many changes to a configuration often compound the problem, whereas you can usually generate and test a new configuration within a few hours.

Quick Configuration

Quick configuration is a process for initial configuration that is available either from the Web browser interface or from the command line interface. It produces a simple configuration that will enable the MSS Server to run in the network. The Web browser interface, which is the more usable of the two interfaces, is recommended.

Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for a complete description of quick configuration using the Web browser interface.

Completing the Configuration After Quick Configuration

After you have completed quick configuration, you must reload the MSS Server to activate the configuration. Then, you can access the MSS Server over the network, if you have configured an IP address for it.

The configuration provided by QCONFIG depends upon many default values for parameters, some of which may not be appropriate to your installation. You may need to modify the configuration that you have created using QCONFIG to customize the MSS Server to work on your network. You can do this using any of these methods:

- Configuration Program
- Web browser HTML interface
- Command line interface

However, the Configuration Program is the preferred configuration method for these reasons:

1. It can enable you to keep a number of copies of configuration files on a server for uploading to the appropriate MSS Servers.
2. It does not alter any configuration parameters dynamically. This feature helps you control changes to the MSS Server configurations.
3. It performs more input validation and cross-checking of the configuration parameters than the other methods.

The command line interface and the Web browser interface cause certain parameters to be altered dynamically. The binary files that they create are saved on the hard disk of the MSS Server, not in the workstation. These characteristics make them more difficult to use for managing the configuration of the MSS Server.

However, they can be used to monitor the operations of the MSS Server, whereas the Configuration Program cannot. They are also useful when you want to change one of the parameters that can be dynamically altered.

How Software Files Are Managed

To help you manage operational software upgrades and configurations, the MSS Server has a software change management feature. This utility enables you to determine which operational software file and which configuration file is active while the MSS Server is running. In addition to storing the active operational software and the active configuration file, the MSS Server stores two backup images of the operational software and up to 11 configuration files in memory.

How to View the Files

To use the change management tool in the command line interface to view the operational software image and the configuration files, follow these steps:

1. From the prompt for OPCON, which is an asterisk (*), type **talk 6**. The prompt **Config>** appears.
2. Enter **boot**. You will see the prompt **Boot config>**.
3. Enter **list** to display information about which load images and configuration files are available and active.

Use the **list** command to display information about which load images and configuration files are available and active.

Syntax: `list`

Example: `Boot config>list`

```
+----- BankA -----+----- Description -----+----- Date -----+
| IMAGE - AVAIL                |                               | 01 Jan 1970          |
| CONFIG 1 - AVAIL             | test config for pubs         | 01 Jan 1970 00:26   |
| CONFIG 2 - AVAIL *           | test config for pubs         | 01 Jan 1970 01:13   |
| CONFIG 3 - AVAIL             |                               | 01 Jan 1970 00:58   |
| CONFIG 4 - AVAIL             |                               | 01 Jan 1970 00:39   |
+----- BankB -----+----- Description -----+----- Date -----+
| IMAGE - ACTIVE                |                               | 01 Jan 1970          |
| CONFIG 1 - AVAIL             | test config for pubs         | 01 Jan 1970 00:54   |
| CONFIG 2 - AVAIL             |                               | 01 Jan 1970 00:01   |
| CONFIG 3 - AVAIL             |                               | 01 Jan 1970 00:14   |
| CONFIG 4 - ACTIVE *          |                               | 01 Jan 1970 00:24   |
+----- BankF -----+----- Description -----+----- Date -----+
| IMAGE - AVAIL                |                               | 01 Jan 1970          |
| CONFIG 1 - AVAIL             | test config for pubs         | 01 Jan 1970 00:54   |
| CONFIG 2 - AVAIL             |                               | 01 Jan 1970 00:01   |
| CONFIG 3 - AVAIL             |                               | 01 Jan 1970 00:14   |
| CONFIG 4 - AVAIL             |                               | 01 Jan 1970 00:24   |
+-----+-----+-----+
* - Last Used Config      L - Config File is Locked
```

The following are the possible file status descriptors:

ACTIVE

The file is currently loaded and is running on the MSS Server.

AVAIL

This is a valid file that can be made ACTIVE.

CORRUPT

The file was damaged or not loaded into the MSS Server completely.
The file must be replaced.

LOCAL

The file will be used only on the next reload or reset. After use, the file is placed in AVAIL state.

PENDING

This file will be loaded on the next reload, reset, or power-up of the MSS Server.

How to Reset the MSS Server

Note: A reset interrupts the function of the MSS Server for up to 90 seconds. Be sure that the network is prepared for the interruption.

As previously stated, PENDING and LOCAL files are not loaded into active memory until you reset the MSS Server.

You can reset the MSS Server using any one of these methods:

- Press the hardware reset button.
- At the Config only> prompt, type **reload**.

Note: The Config only> prompt appears when no file is active. Lack of an active file indicates that an active configuration has become corrupted or that the MSS Server is not configured.

- At the OPCON prompt (*), type **reload**.

Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for syntax and examples for this command.

File Transfer Using TFTP

Use the **TFTP** command to transfer a file from a workstation or server to the MSS Server using TFTP. Use the **tftp** command to initiate TFTP file transfers between MSS Server remote servers.

Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for syntax and examples for this command.

Storing Configuration Files Using the Command Line Interface or the Web Browser Interface

To store a configuration file that you have created using the command line interface, type **write** at the Config> prompt. If you are using the Web browser interface, select *Write*. The Write command creates a binary configuration file that contains the most current value of each of the configuration parameters.

This file is stored in the ACTIVE bank and is given PENDING status. If the status of the file is not changed by a Set command, it becomes the ACTIVE configuration when the MSS Server is reset.

Changing the Statuses of Files

These are the ways to change the statuses of image and configuration files:

- You can cause the MSS Server to perform a reset by using the Send command from the Communications Option of the Configuration Program. When you do this, the file that you send can arrive as a PENDING file or as an AVAIL file. If it is a PENDING file, it becomes the ACTIVE configuration and the previously ACTIVE file becomes AVAIL when the MSS Server is reset.
If it is an AVAIL file, resetting the MSS Server does not change its status.
- You can use the Set config (set config) commands from the Boot config> prompt manually to change the status of any files except the ACTIVE files. If you set a file to PENDING, it becomes ACTIVE and the ACTIVE file becomes AVAIL when a reset is performed.
- When you use the Write command to store a configuration file that you have created using the command line interface or the Web browser interface, it is stored with a PENDING status.
- If you copy a file from one location to another, the file receives the status of the file that was there before it and that it overwrites. For example, if you copy a file with the status of AVAIL over a file that has the status of PENDING, the new file will keep the status of the original file, which is PENDING.

Using the Configuration Program to Manage the Configuration Files

For optimal configuration management, it is recommended that you use the Configuration Program and its configuration data base to manage all your MSS Server configuration files.

The design of change management facilitates good control of the configuration files. Keeping the ACTIVE file and the file that is stored in the configuration data base the same assures that a copy of the ACTIVE file is always available.

When you use the Send option to send a new configuration to the MSS Server, the new configuration is written to the ACTIVE bank and overwrites the file located in the position just below the currently ACTIVE configuration. The new configuration is PENDING if a time is set for a reset. If the configuration file is sent without a specified time for the reset to occur, it gets AVAIL status.

For example, suppose that CONFIG 2 is ACTIVE. The new configuration file is written to CONFIG 3. It has a status of PENDING if a reset time is associated with it; if not, it has a status of AVAIL.

If the file has a status of PENDING, CONFIG 2 becomes AVAIL and CONFIG 3 becomes ACTIVE when a reset occurs. The next file that is sent from the Configuration Program will be placed in CONFIG 4. If a reset time is associated with the file, it will have the PENDING status and will become ACTIVE when the next reset occurs. If another file is then sent, it is placed in CONFIG 1 because the currently ACTIVE file is now in CONFIG 4. This arrangement results in a circular queue.

If the downloaded file has a status of AVAIL, a reset does not change its status. If another file is sent down, it overwrites that file because the ACTIVE file has not changed and the newly downloaded file always occupies the location just behind the ACTIVE file.

Using the Set Commands

Use the **set** command to select the code bank and the configuration to use and the duration of use. The valid durations are:

once The configuration is active for the next boot only.

always The configuration is active for all subsequent boots until changed again.

Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for syntax and examples for this command.

Other Change Management Functions

These change management commands are briefly discussed in this section:

- Describe load images
- Describe config images
- Disable dumping
- Enable dumping
- Erase files

Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference* for syntax and examples for these commands.

Describe Use the **describe** command to display information about a stored image.

Disable Dumping The MSS Server can be set up to dump the contents of memory to permanent storage in the unlikely event of a complete system failure. If dumping is enabled, using this selection will cause the MSS Server *NOT* to dump to disk.

Enable Dumping This command enables the dumping of memory without intervention from anyone in the event that the MSS Server has a catastrophic error. The MSS Server will dump memory onto the hard disk or flash memory. Once a successful dump has been taken, the MSS Server attempts to restart. Depending upon the failure of the MSS Server, it cannot always restart. In this case, you should restart it manually and call a service person, who will dial into the MSS Server to determine the nature and the causes of the failure.

The default state is to have dumping enabled.

Erase Files Use the **erase** command to erase a stored image or a configuration file.

Using the Copy Command

The Copy command allows you to move a file from one location in the storage area to another. This command allows you to change the status as well. The file that you move always receives the status of the storage area that it is moved to. For example, suppose that you have this scenario:

- The configuration file in BANK A CONFIG 1 is AVAIL. The configuration file in BANK B CONFIG 1 is PENDING.
- You copy the configuration in BANK A CONFIG 1 to BANK B CONFIG 1.

| In this case, the original configuration file in BANK A CONFIG 1 remains
| unchanged and AVAIL. The configuration that was in BANK B CONFIG 1 is over-
| written by a copy of the configuration file that is in BANK A CONFIG 1. This copy
| retains the status of the file that it overwrote, in this case, PENDING.

| Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Inter-*
| *face Volume 1: User's Guide and Protocol Reference* for syntax and examples for
| this command.

| **Using the Lock Command**

| The **lock** command allows you to prevent the MSS Server from overwriting the
| selected configuration with any other configuration.

| Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Inter-*
| *face Volume 1: User's Guide and Protocol Reference* for syntax and examples for
| this command.

| **Using the Unlock Command**

| The **unlock** command removes the lock from a configuration allowing the config-
| uration to be updated.

| Refer to *IBM Multiprotocol Switched Services (MSS) Server Command Line Inter-*
| *face Volume 1: User's Guide and Protocol Reference* for syntax and examples for
| this command.

File Transfer

Table 5-1 defines the ways in which configuration files and operational software files can be transferred to and from the MSS Server.

Table 5-1. File Transfer

File Transfer Method	Type of Connection
<p>TFTP Get command from the MSS Server to the workstation that has the binary configuration file, to download operational software images and configuration files to the MSS Server. Files sent using TFTP must be binary, or the MSS Server cannot use them. You should use the Create command of the Configuration Program to save configuration files in binary format before downloading them to the MSS Server.</p> <p>After the MSS Server is operational in the network, you can use the TFTP Put command over IP to upload a file from the MSS Server to a workstation. The file will be uploaded in binary format. Both operational software and configuration files can be uploaded.</p> <p>You should use the Read router configuration option of the Configuration Program to make an uploaded configuration file usable by the Configuration Program so that you can change some parameter values in it.</p> <p>Note: Using TFTP Put is a way to retrieve files from the MSS Server if the Retrieve option of the Configuration Program is not available.</p>	<ol style="list-style-type: none">1. SLIP connection (using the TFTP Get command to download files to the MSS Server).2. IP connection of operational MSS Server over functioning network (using the TFTP Get and Put commands to download and upload files).
<p>The Communications Option of the Configuration Program (actually, the protocol for this is SNMP). This method cannot be used until the MSS Server is operational in the network. The files are not binary, but are in a format that is internal to the Configuration Program. This function can send configuration files to the MSS Server and retrieve them from the server.</p>	<p>IP connection of operational MSS Server over functioning network.</p>

Chapter 6. Removal and Replacement Procedures

This chapter provides the following information on removal and replacement procedures for field-replaceable units (FRUs):

- Preparatory information that applies to all the removal and replacement procedures (see “Before You Start”). This information includes:
 - An overview of the common procedures that you must carry out before you remove or replace FRUs.
 - A list of the equipment you will need.
 - A description of the required safety precautions.
- Descriptions of the common removal and replacement procedures (see “Common Removal and Replacement Procedures” on page 6-2).
- Descriptions of the individual FRU removal and replacement procedures (see “FRU Removal and Replacement Procedures” on page 6-7).

For an overall perspective on the FRUs and their relative positioning to each other and the chassis, see Appendix C, “Parts Listings” on page C-1.

Before You Start

Several common procedures need to be performed in sequence to gain access to the FRUs in the 8210 MSS Server. These common procedures are placed at the beginning of this chapter because they must be performed before you actually begin removing or replacing the FRUs.

Before you begin any removal replacement activity, review the list of equipment you will need, read the common safety precautions and then proceed to the “Common Removal and Replacement Procedures” on page 6-2.

Equipment You Need

You need the following equipment to remove and replace the FRUs in the 8210 MSS Server.

- 7-mm nut driver
- 5/32-inch nut driver
- Flat-blade screwdriver
- Torx** screwdriver T15 (P/N 93F2835)
- Torx screwdriver T20 (P/N 93F2836)
- Screw starter (optional)
- ATM adapter wrap plug, P/N 16G5609 (separately orderable)

Safety Precautions

The MSS Server Module does not have its own power supply and can function only while correctly installed in the 8260; therefore the safety notices in this chapter and Appendix A, “Safety Information” on page A-1 only apply to the 8210 MSS Server.

DANGER

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm. (Refer to DANGER 1 in Appendix A, “Safety Information” for translations.)

DANGER

Hazardous voltages exist inside this machine when it is powered on. Anytime you service this unit with the cover off, be sure to unplug the power cord. (Refer to DANGER 5 in Appendix A, “Safety Information” for translations.)

Common Removal and Replacement Procedures

This section describes the procedures you need to perform to gain access to FRUs in the MSS Server.

Disconnecting the Power Cord

Note: Disconnecting the power cord will disrupt users in your network. Consult the network administrator before disconnecting the power cord.

You need to disconnect the power cord if you need to replace any of the following FRUs:

- AC power supply
- Cooling fan
- Adapter in Port 1
- Adapter in Port 2
- PCI logic card
- Riser
- Memory SIMMs
- Processor logic card

Disconnect the power cord from the ac power outlet and then from the MSS Server.

Where to Go Next

If you are replacing the power cord, continue with “Reconnecting the Power Cord,” otherwise, continue to “Removing the MSS Server from the Rack” on page 6-4.

Reconnecting the Power Cord

DANGER

To avoid shock hazard:

- The power cord must be connected to a properly wired and grounded receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

(Refer to DANGER 4 in Appendix A, “Safety Information” for translations.)

Connect the power cord to the MSS Server and then to the ac power outlet.

Removing the MSS Server from the Rack

Note: Disconnecting the power cord will disrupt users on your network. Consult the network administrator before disconnecting the power cord.

CAUTION:

You must support the unit while you are removing or tightening the screws to avoid dropping it on the floor or on other equipment beneath it in the rack. The unit weighs approximately 6,7 kg (14.5 lb). (Refer to CAUTION 1 in Appendix A, “Safety Information” for translations.)

- 1** Disconnect the power cord from the ac outlet and then from the MSS Server.
- 2** Label the cable attached to the ATM adapter connectors.
- 3** Disconnect the cable.
- 4** Remove the PCMCIA devices (the hard drive and modem).
- 5** Remove all loose items from the top of the MSS Server.
- 6** Remove the four screws that hold the MSS Server in the rack.
- 7** Remove the MSS Server from the rack by pulling it toward you.
- 8** Place the MSS Server on a flat surface.

Where to Go Next

You need to remove the top cover if you need to remove and replace any of the following FRUs:

- AC power supply
- Cooling fan
- Adapter in Port 1
- Adapter in Port 2
- PCI logic card
- Riser
- Memory SIMMs
- Processor logic card

Go to “Removing the Top Cover” on page 6-5 for instructions about removing the top cover.

Replacing the MSS Server

CAUTION:

You must support the unit while you are removing or tightening the screws to avoid dropping it on the floor or on other equipment beneath it in the rack. The unit weighs approximately 6,7 kg (14.5 lb). (Refer to CAUTION 1 in Appendix A, “Safety Information” for translations.)

- 1** Insert one of the screws into the MSS Server bracket.

- 2** Lift the MSS Server into position, lining up the screw and the MSS Server with the rack.
- 3** Partially tighten the screw.
- 4** Insert and partially tighten the screw in the other bracket.
- 5** Insert the other screw in each bracket and tighten all screws.
- 6** Install the PCMCIA modem into the rightmost slot (when facing the front of the 8210 MSS Server), or top slot (when facing the front of the MSS Server Module). Install and connect the modem cable.
- 7** Install the PCMCIA hard drive.
- 8** Connect the power cord to the MSS Server and then to the ac outlet.
- 9** Test the MSS Server as outlined in “Selecting a Device To Test” on page 4-6.

Removing the Top Cover

DANGER

Hazardous voltages exist inside this machine when it is powered on. Anytime you service this unit with the cover off, be sure to unplug the power cord. (Refer to DANGER 5 in Appendix A, “Safety Information” for translations.)

Note: Disconnecting the power cord will disrupt users connected to this MSS Server. Consult the network administrator before disconnecting the power cord.

- 1** Disconnect the power cord from the ac outlet and then from the MSS Server.
- 2** Remove the MSS Server from the rack.
- 3** Place the MSS Server on a flat surface.
- 4** Remove the three screws on each side of the MSS Server and remove the brackets that hold the MSS Server in the rack. Save the screws to use when you reinstall the top cover.
- 5** Lift the rear edge of the top cover and pull it to the rear of the MSS Server to disengage the tabs on the top cover that engage the front of the 8210.
- 6** Lift up the rear of the top cover and pull it up and away from the front of the MSS Server.

Where to Go Next

Go to “FRU Removal and Replacement Procedures” on page 6-7 to find the appropriate procedures for the FRU you need to remove or replace.

When you have removed and replaced the FRU, go to “Reinstalling the Top Cover” on page 6-6.

Reinstalling the Top Cover

- 1** Align the top cover tabs with the slots in the inside of the front of the MSS Server and slide the top cover forward until the tabs engage the slots.
- 2** Secure the brackets on each side of the MSS Server with the six screws you removed during removal of the cover.
- 3** Place the MSS Server in the rack.
- 4** Reinstall the PCMCIA hard drive.
- 5** Reinstall the PCMCIA modem and cable.
- 6** Connect the ATM adapter cable.
- 7** Connect the ac power cord to the MSS Server and then to the power source.

FRU Removal and Replacement Procedures

This section outlines the removal and replacement procedures for each of the FRUs in the MSS Server.

Note: The figures in this section do not always show all the parts (FRUs). Do not remove a part just because it is not shown in a figure.

Use the following table to find the appropriate procedure for the FRU you need to remove or replace.

FRU	Procedure
AC power supply	Go to “Removing the Power Supply” on page 6-8.
Cooling fan	Go to “Removing the Cooling Fan” on page 6-10.
Adapter in Port 1	Go to “Removing the Adapter from Port 1 (Bottom Slot)” on page 6-14.
Adapter in Port 2	Go to “Removing the Adapter from Port 2 (Top Slot)” on page 6-12.
Memory SIMMs	Go to “Removing the Memory SIMMs” on page 6-20.
PCI logic card	Go to “Removing the PCI Logic Card” on page 6-16.
Riser	Go to “Removing the Riser” on page 6-18.
Processor logic card	Go to “Removing the Processor Logic Card” on page 6-23.

Familiarize yourself with the location of each FRU (Figure 6-1).

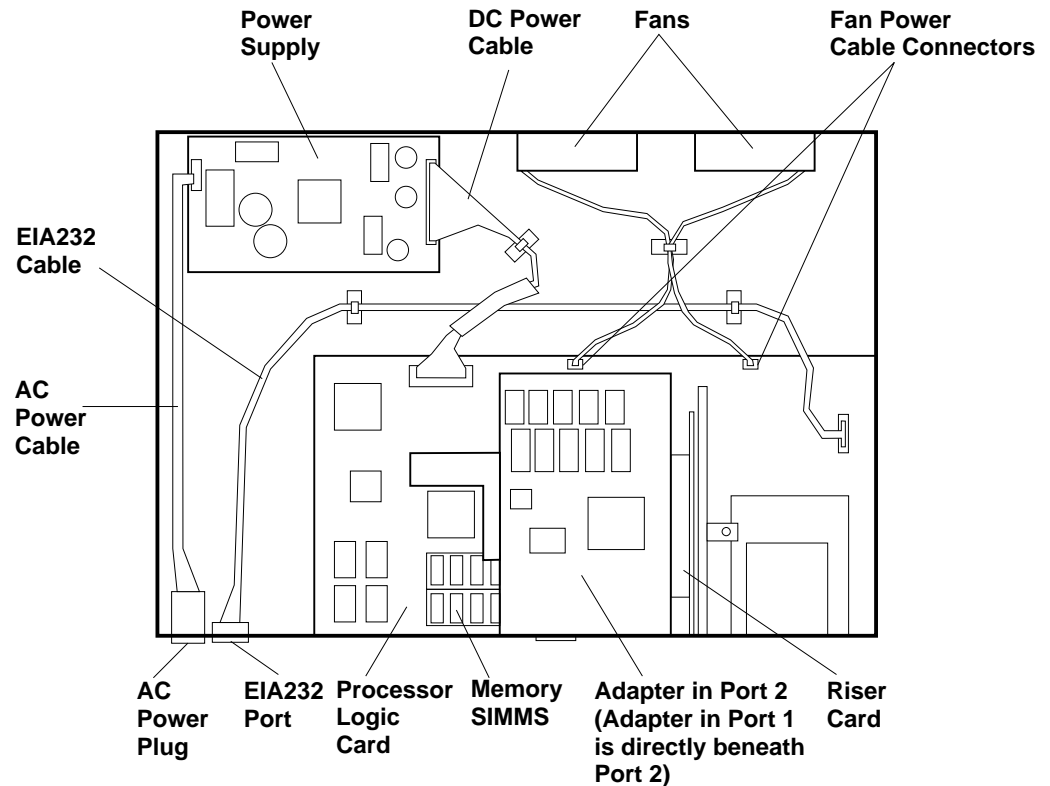


Figure 6-1. View of the MSS Server with Top Cover Removed

Removing the Power Supply

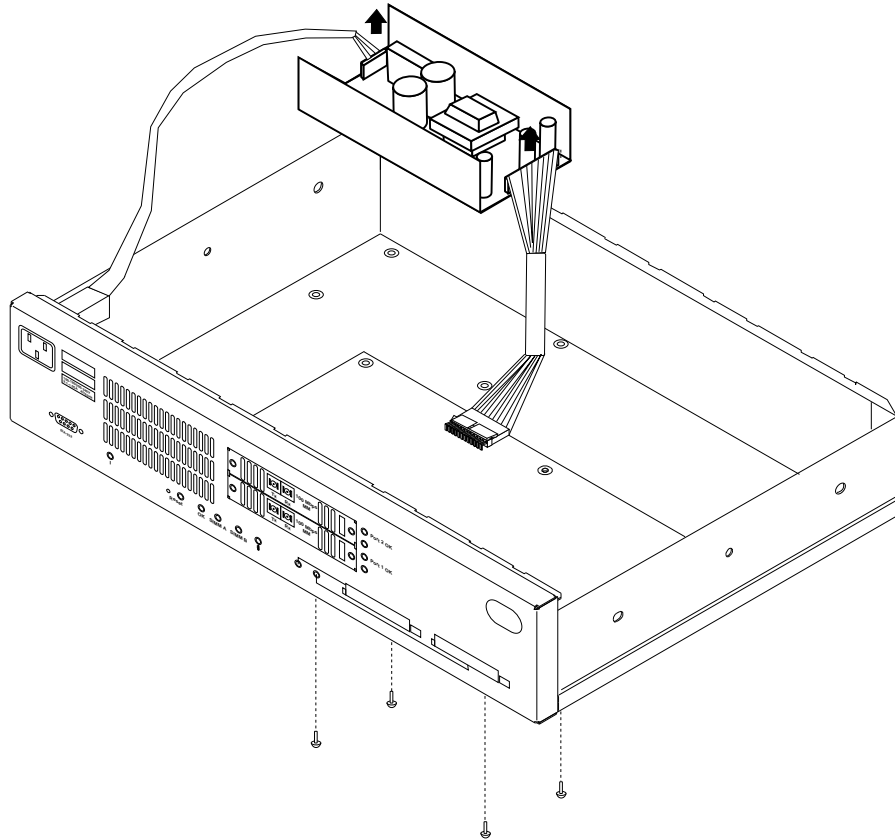


Figure 6-2. 8210 MSS Server Power Supply

- 1** With the top cover off, set the MSS Server on its edge where you can see the four screws that fasten the ac power supply in place (from the bottom side). See Figure 6-2.
- 2** Loosen and remove the four screws while supporting the ac power supply to avoid dropping it or otherwise damaging the unit.
- 3** Set the MSS Server down on the flat surface (bottom side down).
- 4** Disconnect the ac and dc power cable connectors from the ac power supply.
- 5** Carefully remove the ac power supply from the MSS Server.
- 6** Obtain the replacement ac power supply, place the MSS Server on its edge, and fasten the new ac power supply into position with the four screws. Reconnect the ac and dc power cable connections.

Where to Go Next

- 1** If your only task was to remove and replace the ac power supply, you are ready to go to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6.
- 2** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table-mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 3** Reattach the ATM cable and modem cable.
- 4** Connect the ac power cord to the MSS Server and then to the power source.

Removing the Cooling Fan

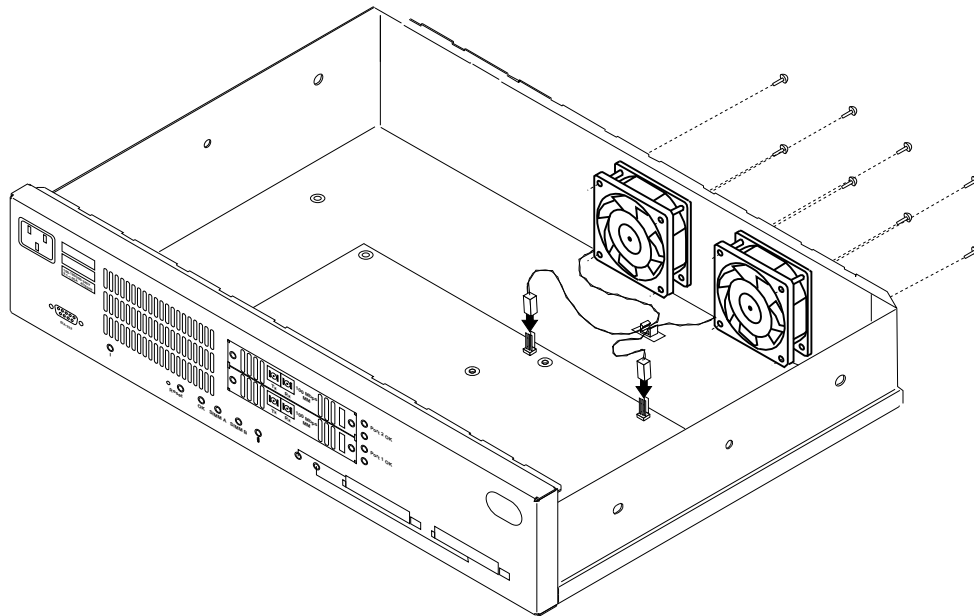


Figure 6-3. Fan Locations in the MSS Server

- 1** Using a 5/32-inch nut driver or a screwdriver, remove the four screws that hold the cooling fan assembly in place.
- 2** Disconnect the cable that connects the cooling fan to the processor logic card.
- 3** Ensure that the cable is free from the cable clamps in the bottom of the MSS Server.
- 4** Carefully remove the cooling fan from the MSS Server.

Where to Go Next

If your only task was to remove and reinstall the cooling fan, you are ready to go to “Installing the Cooling Fan” on page 6-11.

Installing the Cooling Fan

- 1** Using a 5/32-inch nut driver or a screwdriver, and holding the cooling fan assembly in place, reinstall the four screws that secure the cooling fan assembly in the MSS Server
- 2** Connect the cable that connects the cooling fan to the processor logic card.
- 3** Run the cable through the cable clamps in the bottom of the MSS Server.
- 4** If your only task was to remove and replace the cooling fan, you are ready to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6, and then return here to continue.
- 5** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table-mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 6** Reattach the ATM cable and PCMCIA modem cable.
- 7** Connect the ac power cord to the MSS Server and then to the power source.

Removing the Adapter from Port 2 (Top Slot)

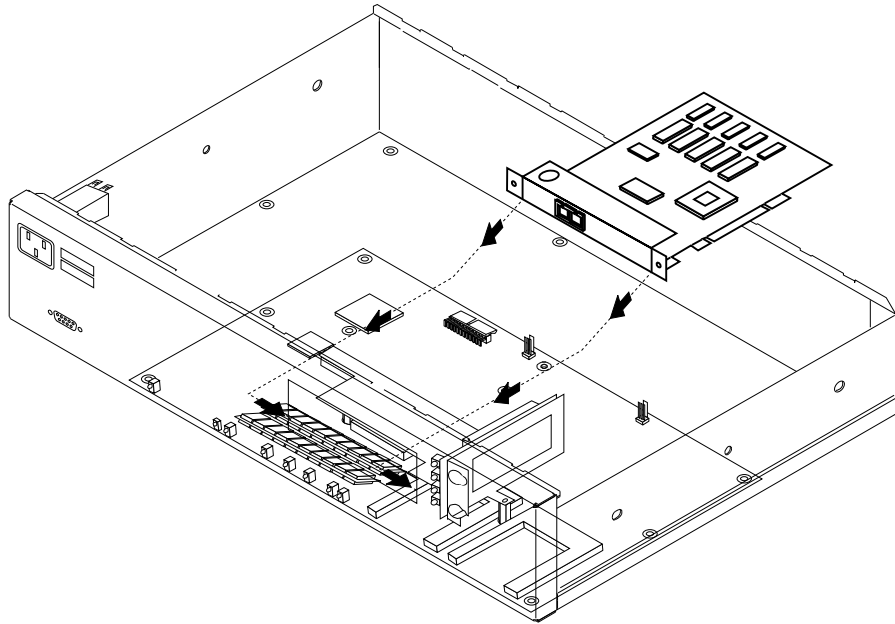


Figure 6-4. Adapter from Port 2

Note: FDDI and ATM adapters may be installed in Port 2 (top slot). This is the only slot in which FDDI adapters may be installed.

- 1** Using a T-20 Torx screwdriver, remove the two screws (front cover side) that hold the adapter in Port 2 (top slot).
- 2** Gently press the adapter face plate toward the back of the MSS Server while pulling the back corner of the printed circuit card (opposite the connector-side of the card) until the card connector clears its connector socket.
- 3** Holding the adapter by the front plate, remove it from the MSS Server.

Where to Go Next

If your only task was to remove and reinstall an adapter in Port 2, you are ready to go to “Replacing the Adapter in Port 2” on page 6-13.

Replacing the Adapter in Port 2

Note: FDDI and ATM adapters may be installed in Port 2 (top slot). This is the only slot in which FDDI adapters may be installed.

1 Obtain the new adapter for Port 2.

2 Remove the adapter, in its antistatic bag, from its shipping container.

Attention: Electrostatic discharge (ESD) can damage the static-sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:

- Do not remove the adapter from its antistatic bag until you are ready to insert it into the MSS Server.
- Use correct grounding techniques when inspecting and installing the adapter. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the adapter.

3 Remove the adapter from the antistatic bag. Inspect it for damage. Always handle the adapter by the faceplate; do not touch its components. If the adapter appears to be damaged, return it to the antistatic bag and contact the supplier.

4 Holding the adapter by the faceplate and by the back corner of the circuit card (opposite the connector side), guide the adapter faceplate into the slot. Move it forward until the connector is correctly aligned with the riser connector. Press firmly on the edge of the card (opposite the connector side) to correctly seat the adapter into the riser.

5 Re-install the two T-20 Torx screws.

6 If your only task was to remove and reinstall the adapter in Port 2, you are ready to reinstall the top cover and side brackets. Go to "Reinstalling the Top Cover" on page 6-6 and return here to continue.

7 Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table-mounted. Go to "Replacing the MSS Server" on page 6-4 and return here to continue.

8 Reattach the adapter and modem cables.

9 Connect the ac power cord to the MSS Server and then to the power source.

Removing the Adapter from Port 1 (Bottom Slot)

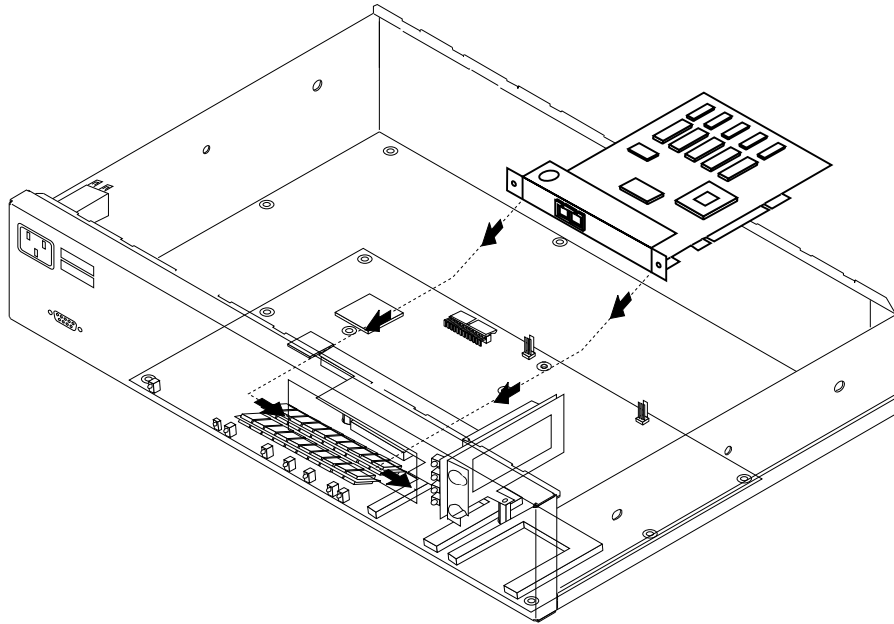


Figure 6-5. Adapter in Port 1

Note: Only ATM adapters may be installed in Port 1 (bottom slot).

To remove the adapter from Port 1 (bottom slot):

- 1** If your MSS Server has two adapters, you must remove the adapter from Port 2 (top slot) before you can gain access to the adapter in Port 1. If this is the case, follow the instructions in “Removing the Adapter from Port 2 (Top Slot)” on page 6-12 and return here to continue.
- 2** Using a T-20 Torx screwdriver, remove the two screws (front cover side) that hold the adapter in place.
- 3** Gently press the adapter faceplate toward the back of the MSS Server while pulling the back corner of the printed circuit card (opposite the connector-side of the card) until the card connector clears its riser connector socket.
- 4** Holding the adapter by the front plate, remove it from the MSS Server.
- 5** Obtain the new adapter for Port 1, and install it by following the steps outlined in “Replacing the Adapter in Port 1” on page 6-15.

Where to Go Next

If your only task was to remove and reinstall the adapter in Port 1, you are ready to go to “Replacing the Adapter in Port 1” on page 6-15.

Replacing the Adapter in Port 1

- 1** Obtain the new adapter for Port 1.
- 2** Remove the adapter, in its antistatic bag, from its shipping container.
Attention: Electrostatic discharge (ESD) can damage the static-sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:
 - Do not remove the adapter from its antistatic bag until you are ready to insert it into the MSS Server.
 - Use correct grounding techniques when inspecting and installing the adapter. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the adapter.
- 3** Remove the adapter from the antistatic bag. Inspect it for damage. Always handle the adapter by the faceplate; do not touch its components. If the adapter appears to be damaged, return it to the antistatic bag and contact the supplier.
- 4** Holding the adapter by the faceplate and by the back corner of the circuit card (opposite the connector side), guide the adapter faceplate into the slot. Move it forward until the connector is correctly aligned with the riser connector. Press firmly on the edge of the card (opposite the connector side) to correctly seat the adapter into the riser.
- 5** If you had an adapter in Port 2, reinstall the adapter in Port 2 as previously described.
- 6** Re-install the two T-20 Torx screws.
- 7** If your only task was to remove and reinstall the adapter in Port 1, you are ready to go to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6.
- 8** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 9** Reattach the adapter cable and modem cable.
- 10** Connect the ac power cord to the MSS Server and then to the power source.

Removing the PCI Logic Card

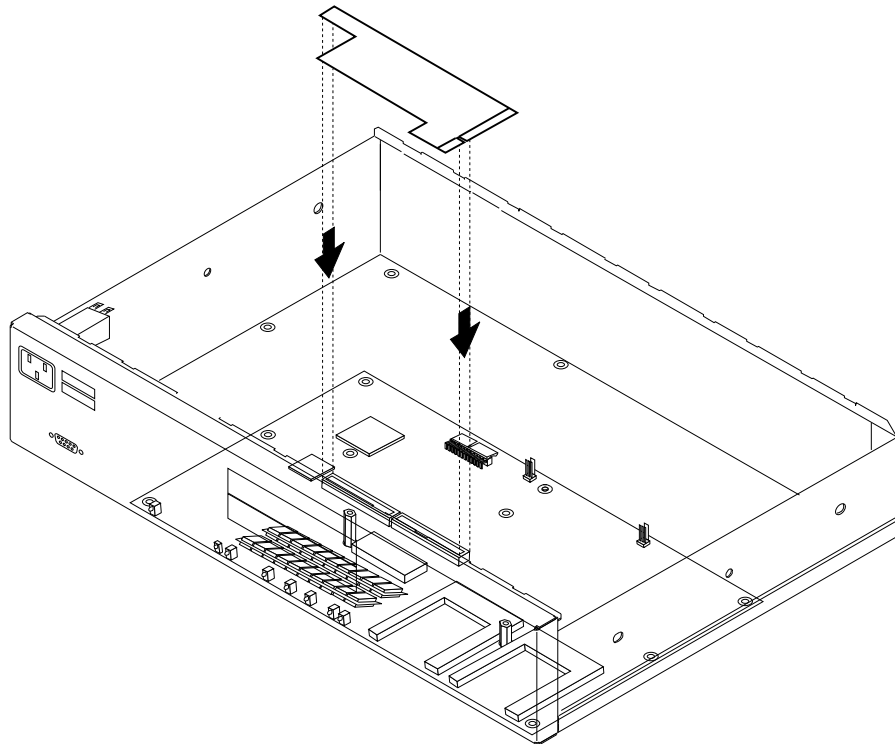


Figure 6-6. PCI Logic Card

- 1** Remove the ATM adapter in Port 2 (see “Removing the Adapter from Port 1 (Bottom Slot)” on page 6-14).
- 2** Remove the ATM adapter in Port 1 (see “Removing the Adapter from Port 2 (Top Slot)” on page 6-12).
- 3** Using a 5/32-inch nut driver, remove the two screws fastening the PCI logic card and riser bracket.
- 4** Gently lift the PCI logic card out of its connector socket on the processor logic card and remove it from its connector in the riser.

Where to Go Next

If your only task was to remove and reinstall the PCI logic card, you are ready to go to “Replacing the PCI Logic Card” on page 6-17.

Replacing the PCI Logic Card

- 1** Obtain the new PCI logic card.
- 2** Remove the PCI logic card, in its antistatic bag, from its shipping container.
Attention: Electrostatic discharge (ESD) can damage the static-sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:
 - Do not remove the PCI logic card until you are ready to insert it into the MSS Server.
 - Use correct grounding techniques when inspecting and installing the PCI logic card. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the PCI logic card.
- 3** Remove the PCI logic card from the antistatic bag. Inspect it for damage. Always handle the PCI logic card by the edges (preferably grasp it between the middle finger and thumb; do not touch the components). If the PCI logic card appears to be damaged, return it to the antistatic bag and contact the supplier.
- 4** Grasping the PCI logic card between the middle finger and thumb, position its bottom connector over its processor logic card connector socket, and aligned with its riser connector.
- 5** Gently insert the PCI logic card into its connector socket in the riser and position it into its connector on the processor logic card. Correctly seat the PCI logic card into its connectors.
- 6** Align and reinstall the two 5/32-inch screws; one in the outer edge of the PCI logic card and the other in the riser metal bracket.

Where to Go Next

If your only task was to remove and replace the PCI logic card:

- 1** Replace the ATM adapter in Port 1 (see “Replacing the Adapter in Port 1” on page 6-15).
- 2** Replace the ATM adapter in Port 2 (see “Replacing the Adapter in Port 2” on page 6-13). You are ready to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6.
- 3** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 4** Reattach the ATM cable and PCMCIA modem cable.
- 5** Connect the ac power cord to the MSS Server and then to the power source.

Removing the Riser

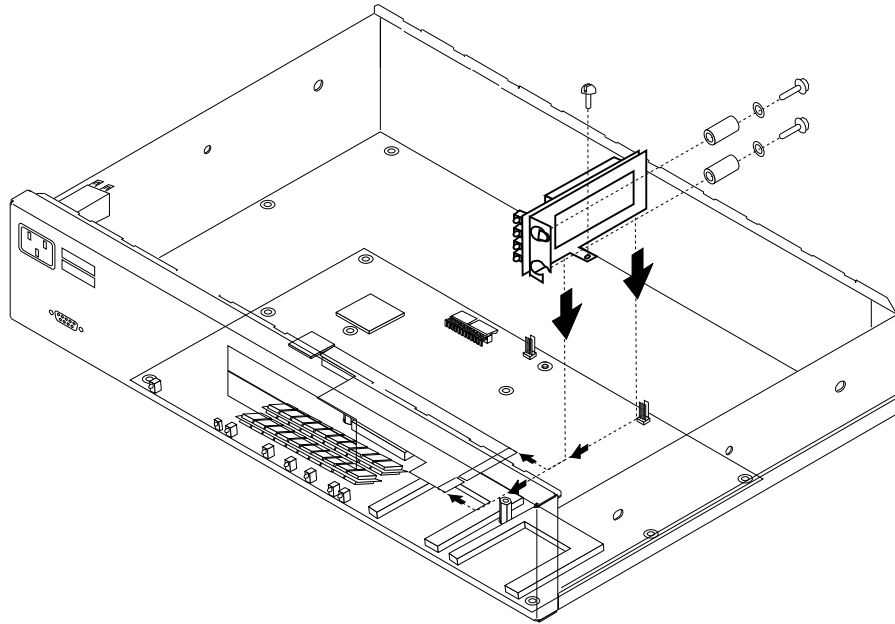


Figure 6-7. Riser

- 1** Using a 5/32-inch nut driver, remove the screws fastening the PCI logic card and riser bracket.
- 2** Using a 7-mm nut driver, remove the two screws and spacers that hold the riser bracket to the backside of the MSS Server faceplate.
- 3** Gently lift the PCI logic card out of its connector socket on the processor logic card and remove it from its connector in the riser. Place it on a grounded surface to avoid damage to the circuitry.
- 4** Move the riser bracket toward the back of the MSS Server until it clears the studs (back side of MSS Server faceplate).

Replacing the Riser

- 1** Obtain the new riser
- 2** Handling it by its metal bracket, position it over the studs (back side of MSS Server faceplate).
- 3** Gently insert the PCI logic card into its connector socket in the riser and position it into its connector on the processor logic card. Correctly seat the PCI logic card connectors.
- 4** Align and reinstall the two 5/32-inch screws. Place the two spacers over the studs (backside of the MSS Server) and reinstall the two 7-mm screws.

Where to Go Next

If your only task was to remove and replace the riser:

- 1** Reinstall the adapters in ports 1 and 2. Follow the instructions in “Replacing the Adapter in Port 1” on page 6-15 and in “Replacing the Adapter in Port 2” on page 6-13 and then return here to continue.
- 2** You are ready to reinstall the top cover and side brackets. Follow the instructions in “Reinstalling the Top Cover” on page 6-6 and return here to continue.
- 3** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 4** Reattach the ATM cable and modem cable.
- 5** Connect the ac power cord to the MSS Server and then to the power source.

Removing the Memory SIMMs

The MSS Server comes from the manufacturer with a minimum of 32 MB (two SIMMs). SIMM sockets are located directly below the ATM adapters (see Figure 6-8). SIMM sockets are accessible only after the two ATM adapters are removed.

This procedure can be used for removing faulty SIMM modules or to install memory upgrades to your MSS Server.

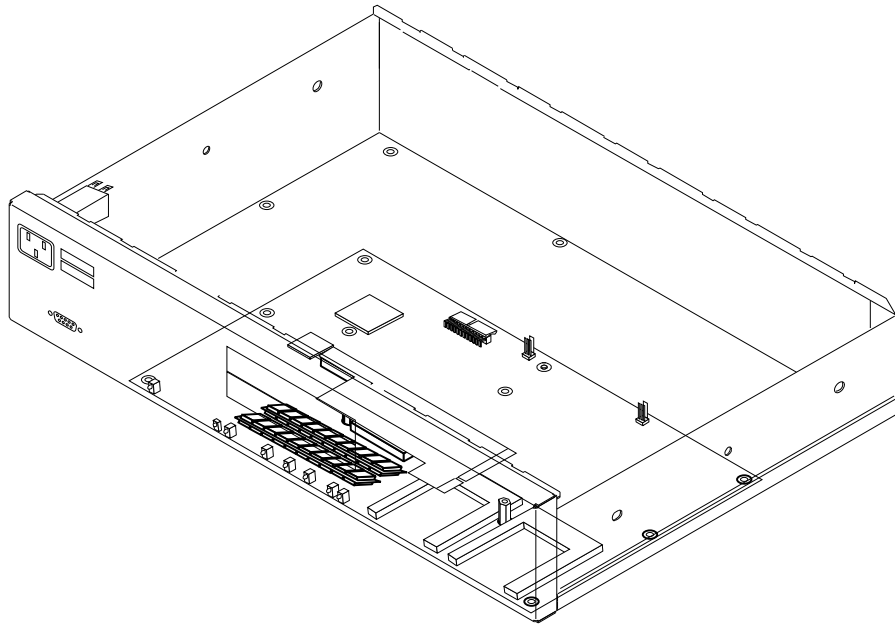


Figure 6-8. Memory (SIMM) Modules

- 1** Remove the ATM adapter in Port 2 (see “Removing the Adapter from Port 1 (Bottom Slot)” on page 6-14).
- 2** Remove the ATM adapter in Port 1 (see “Removing the Adapter from Port 2 (Top Slot)” on page 6-12).

- 3** The SIMM sockets are exposed. SIMM-A is positioned closest the front of the MSS Server, and SIMM-B is positioned in the back.
- 4** Identify the faulty memory module. Spring latches, at each end of the SIMM socket, secure the memory module. Using your thumbnail or a small non-metallic device, gently move the spring latch away from the end of the SIMM while moving the SIMM card toward the back of the MSS Server.
- 5** When the SIMM card ends are free of the latches, lift the SIMM module up, out of its connector socket, and out of the MSS Server.

Where to Go Next

If your only task was to remove and replace the memory SIMM, you are ready to go to “Replacing the Memory SIMMs” on page 6-22.

Replacing the Memory SIMMs

- 1** Obtain the new memory SIMM.
- 2** Remove the memory SIMM, in its antistatic bag, from its shipping container.
Attention: Electrostatic discharge (ESD) can damage the static-sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:
 - Do not remove the memory SIMM until you are ready to insert it into the MSS Server.
 - Use correct grounding techniques when inspecting and installing the memory SIMM. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the memory SIMM.
- 3** Remove the memory SIMM from the antistatic bag. Inspect it for damage. Always handle the memory SIMM by the ends (preferably grasp it between the middle finger and thumb; do not touch the components). If the memory SIMM appears to be damaged, return it to the antistatic bag and contact the supplier.
- 4** Grasping the memory SIMM between the middle finger and thumb, place it connector edge down into the SIMM socket. Applying slight pressure to the top edge of the memory SIMM, move it forward until it is correctly aligned and snaps in place in the spring clips.
- 5** Replace the ATM adapter in Port 1 (see “Replacing the Adapter in Port 1” on page 6-15).
- 6** Replace the ATM adapter in Port 2 (see “Replacing the Adapter in Port 2” on page 6-13).
- 7** If your only task was to remove and replace or initially install a memory SIMM, you are ready to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6 and return here to continue.
- 8** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table-mounted. Go to “Replacing the MSS Server” on page 6-4.
- 9** Reattach the ATM cable and modem cable.
- 10** Connect the ac power cord to the MSS Server and then to the power source.

Removing the Processor Logic Card

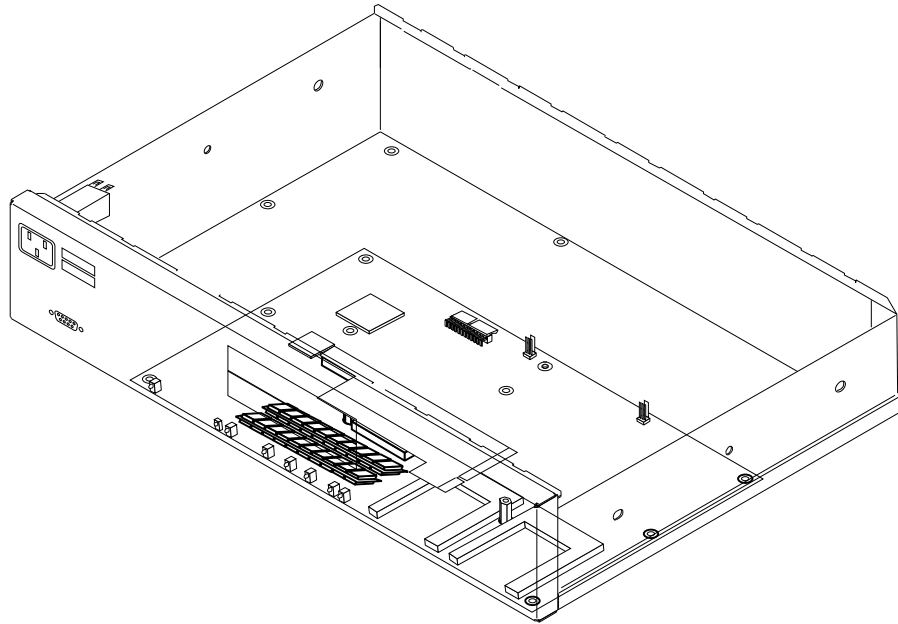


Figure 6-9. Processor Logic Card

- 1** Ensure the PCMCIA hard drive and modem are removed and set them safely aside.
- 2** If the ATM adapter in Port 2 is reusable, remove it and set it safely aside for reinstallation (see “Removing the Adapter from Port 1 (Bottom Slot)” on page 6-14).
- 3** If the ATM adapter in Port 1 is reusable, remove it and set it safely aside for reinstallation (see “Removing the Adapter from Port 2 (Top Slot)” on page 6-12).
- 4** If the PCI logic card is reusable, remove it and set it safely aside for reinstallation (see “Removing the PCI Logic Card” on page 6-16).
- 5** If the riser is reusable, remove it and set it safely aside for reinstallation (see “Removing the Riser” on page 6-18).
- 6** If the memory SIMMs are reusable, remove them and set them safely aside for reinstallation (see “Removing the Memory SIMMs” on page 6-20).
- 7** Disconnect the cable connectors for the cooling fan, ac power supply, and the service port cable connector. Position them to prevent damaging them in the replacement procedure.
- 8** Using a 7-mm nut driver, loosen and remove the long and short standoffs that support the riser and PCI logic card. Set them safely aside for reuse in the replacement procedure.

9 Using a 5/32-inch nut driver, remove the screws that secure the processor logic card to the inside bottom of the MSS Server. Set them safely aside for reuse in the replacement procedure.

10 Remove the processor logic card.

11 Remove any unidentified items from the inside of the MSS Server chassis. Clean the bottom inside surface to remove dust and so forth.

Where to Go Next

If your only task was to remove and replace the processor logic card, you are ready to go to “Replacing the Processor Logic Card” on page 6-25.

Replacing the Processor Logic Card

- 1** Obtain the new processor logic card.
- 2** Remove the processor logic card, in its antistatic bag, from its shipping container.
Attention: Electrostatic discharge (ESD) can damage the static sensitive devices on circuit boards. To avoid this kind of damage, use the following precautions:
 - Do not remove the processor logic card until you are ready to insert it into the MSS Server.
 - Use correct grounding techniques when inspecting and installing the processor logic card. Use a foot strap or grounding mat, or wear a grounded static discharge wrist strap, or touch a grounded rack or other source of ground before you handle the processor logic card.
- 3** Remove the processor logic card from the antistatic bag. Inspect it for damage. Always handle the processor logic card by the edges (preferably grasp it between the fore finger and thumb); do not touch the components. If the processor logic card appears to be damaged, return it to the antistatic bag and contact the supplier.
- 4** Ensure that the inside bottom of the MSS Server is clear and clean.
- 5** Correctly grasping the processor logic card, place it in the bottom of the MSS Server, aligning the hold-down screw holes, and ensuring the cable connectors are positioned to the rear of the MSS Server (toward the cooling fan and ac power supply).
- 6** Reinstall the long and short standoffs that support the riser and PCI logic card.
- 7** Reinstall the 5/32-inch screws that secure the processor logic card to the bottom of the chassis.
- 8** Replace the memory SIMMs (see “Replacing the Memory SIMMs” on page 6-22).
- 9** Replace the riser (see “Replacing the Riser” on page 6-19).
- 10** Replace the PCI logic card (see “Replacing the PCI Logic Card” on page 6-17).
- 11** Replace the ATM adapter in Port 1 (see “Replacing the Adapter in Port 1” on page 6-15).
- 12** Replace the ATM adapter in Port 2 (see “Replacing the Adapter in Port 2” on page 6-13).

- 13** Reinstall the PCMCIA modem (see “Replacing the PCMCIA Modem” on page 6-29).
- 14** Reinstall the PCMCIA hard drive (see “Replacing the PCMCIA Hard Drive” on page 6-27).
- 15** Using the firmware utility (“Viewing or Setting Vital Product Data” on page 4-15), access the VPD record and enter the new processor card serial number in **Box serial number** field.
- 16** Reconnect the cable connectors for the cooling fan, power supply, and service port to the processor logic card.

Where to Go Next

- 1** If your only task was to remove and replace the processor logic card, you are ready to reinstall the top cover and side brackets. Go to “Reinstalling the Top Cover” on page 6-6 and return here to continue.
- 2** Reinstall the MSS Server into the rack with its cable bracket if it was rack-mounted, or place it in its position if it was table-mounted. Go to “Replacing the MSS Server” on page 6-4 and return here to continue.
- 3** Reattach the ATM cable and modem cable.
- 4** Connect the ac power cord to the MSS Server and then to the power source.

Replacing the PCMCIA Hard Drive

Attention: The PCMCIA modem must be located in the rightmost slot (when facing the front of the 8210 MSS Server), or top slot (when facing the front of the MSS Server Module). The PCMCIA hard drive and modems are “hot pluggable” devices; therefore, it is not necessary to disconnect power before removing and reinstalling these PCMCIA devices.

To remove and replace the PCMCIA hard file:

- 1** Holding one hand beneath the PCMCIA device slot, press the device eject button (located to the right or top of the device).
- 2** Obtain the replacement device and insert it in the slot. Ensure that the device is completely seated (yellow LED goes off).
- 3** See Appendix G, “MSS Server Module LED Status Indicators” on page G-1 or Appendix F, “8210 Nways MSS Server LED Indicators” on page F-1 and verify that the replacement device is operational by the correct state of the LEDs.

Installing Operational Software on the Hard Drive

Note: This procedure should be performed by trained IBM service personnel. Customers who need this done should contact IBM service.

Follow these steps to install the operational software on the PCMCIA hard drive:

- 1** First, restart the MSS Server in attended mode or enter **Ctrl C** during the load sequence from a console. More information about attended mode is found in the *IBM Multiprotocol Switched Services (MSS) Server Command Line Interface Volume 1: User's Guide and Protocol Reference*.
- 2** Enter the supervisory password or the IBM service password.
- 3** From the Menu screen choose *DIAGS*. When the PCMCIA box appears, enter the supervisory password or the IBM service password.
- 4** Press **Esc** to exit *DIAGS* and to bring up the Resident Monitor prompt.
- 5** At the Resident Monitor prompt, type **fdisk 0**. Press Enter.
- 6** When the formatting is done, type **c:.** Press Enter.
- 7** Enter the following commands, which are similar to DOS commands, to generate directories for the hard drive.

```
md c:\sys0
md c:\sys1
md c:\vru
md c:\vru\files
md c:\vru\fax
md c:\vru\maint
```

- 8** Type **core init** and press Enter. This command sets up a dump area on the hard disk. The hard drive is now prepared to receive operational software files.
- 9** Use TFTP to transfer the complete set of operational software files from a workstation to the MSS Server hard drive.

See “File Transfer Using TFTP” on page 5-4 and “File Transfer” on page 5-8 for instructions. Note that you transfer the files to Banks within the MSS Server. These Banks represent the directories that you have just created; you do not have to be concerned about transferring the files to a particular directory within the MSS Server.
- 10** After you have successfully transferred the operational software, you must go through the configuration steps outlined in Chapter 5, “Managing Operational Code and Configuration Files.”, specifically the Set commands.

Replacing the PCMCIA Modem


Attention: Proper installation according to these instructions is a condition for compliance with the regulations of electromagnetic interference.


The PCMCIA modem must be located in the rightmost slot (when facing the front of the 8210 MSS Server), or top slot (when facing the front of the MSS Server Module). The PCMCIA hard drive and modems are “hot pluggable” devices; therefore, it is not necessary to disconnect power before removing and reinstalling these PCMCIA device.


To remove and replace the PCMCIA modem:


- 1** Disconnect the cable from the PCMCIA modem.
- 2** Holding one hand beneath the PCMCIA device slot, press the device eject button (located to the right or top of the device).
- 3** Obtain the replacement device and insert it in the slot. Ensure that the device is completely seated (yellow LED goes off).
- 4** Reconnect the PCMCIA modem cable.
- 5** See Appendix G, “MSS Server Module LED Status Indicators” on page G-1 or Appendix F, “8210 Nways MSS Server LED Indicators” on page F-1 and verify the replacement device is operational by the correct status of the LEDs.


Appendix A. Safety Information


 **Danger:** Before you begin to install this product, read the safety information in *Caution: Safety Information—Read This First*, SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.


 **Varning — livsfara:** Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dokumentet *Varning: Säkerhetsföreskrifter— Läs detta först*, SD21-0030. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.

 **Fare:** Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Advarsel: Sikkerhetsinformasjon — Les dette først*, SD21-0030 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.

 **Fare!** Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *NB: Sikkerhedsforskrifter—Læs dette først* SD21-0030. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.


 **Gevaar:** Voordat u begint met de installatie van dit product, moet u eerst de veiligheidsinstructies lezen in de brochure *PAS OP! Veiligheidsinstructies—Lees dit eerst*, SD21-0030. Hierin wordt beschreven hoe u elektrische apparatuur op een veilige manier moet bekabelen en aansluiten.


 **Gevaar** Voordat u begint met het installeren van dit product, dient u eerst de veiligheidsrichtlijnen te lezen die zijn vermeld in de publikatie *Caution: Safety Information - Read This First*, SD21-0030. In dit boekje vindt u veilige procedures voor het aansluiten van elektrische apparatuur.


 **Vorsicht:** Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Achtung: Sicherheitsinformationen—Bitte zuerst lesen*, IBM Form SD21-0030. Diese Veröffentlichung beschreibt die Sicherheitsvorkehrungen für das Verkabeln und Anschließen elektrischer Geräte.





危険： 導入作業を開始する前に、安全に関する小冊子SD21-0030 の「最初にお読みください」(Read This First)の項をお読みください。この小冊子は、電気機器の安全な配線と接続の手順について説明しています。


 **Danger :** Avant d'installer le présent produit, consultez le livret *Attention : Informations pour la sécurité — Lisez-moi d'abord*, SD21-0030, qui décrit les procédures à respecter pour effectuer les opérations de câblage et brancher les équipements électriques en toute sécurité.


 **Danger:** Avant de procéder à l'installation de ce produit, lisez d'abord les consignes de sécurité dans la brochure *ATTENTION: Consignes de sécurité—A lire au préalable*, SD21-0030. Cette brochure décrit les procédures pour câbler et connecter les appareils électriques en toute sécurité.

 **Pericolo:** prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Attenzione: Informazioni di sicurezza — Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.

 **Perigo:** Antes de iniciar a instalação deste produto, leia as informações de segurança *Cuidado: Informações de Segurança — Leia Primeiro*, SD21-0030. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.

 **Peligro:** Antes de empezar a instalar este producto, lea la información de seguridad en *Atención: Información de Seguridad — Lea Esto Primero*, SD21-0030. Este documento describe los procedimientos de seguridad para cablear y enchufar equipos eléctricos.

 **Perigo:** Antes de começar a instalar este produto, leia as informações de segurança contidas em *Cuidado: Informações Sobre Segurança—Leia Isto Primeiro*, SD21-0030. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos elétricos.

 **VAARA:** Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Varoitus: Turvaohjeet—Lue tämä ensin*, SD21-0030, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, miten sähkölaitteet kaapeloidaan ja kytketään turvallisesti.



위험: 이 제품을 설치하기 전에 반드시
"주의: 안전 정보-시작하기 전에"
(SD21-0030) 에 있는 안전 정보를
읽으십시오.



危險：安裝本產品之前，請先閱讀
"Caution: Safety Information--Read
This First" SD21-0030 手冊中所提
供的安全注意事項。這本手冊將會說明
使用電器設備的纜線及電源的安全程序。



Uwaga:
Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją:
"Caution: Safety Information - Read This First", SD21-0030.
Zawiera ona warunki bezpieczeństwa przy podłączaniu do sieci elektrycznej
i eksploatacji.



Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si
nejprve bezpečnostní informace v pokynech „Bezpečnostní
informace“ č. 21-0030. Tato brožurka popisuje bezpečnostní
opatření pro kabeláž a zapojení elektrického zařízení.



Vigyázat: Mielőtt megkezdi a berendezés üzembe helyezését, olvassa el a
Caution: Safety Information— Read This First, SD21-0030 könyvecskében leírt
biztonsági információkat. Ez a könyv leírja, milyen biztonsági intézkedéseket kell
megtenni az elektromos berendezés huzalozásakor illetve csatlakoztatásakor.



Pozor: Preden začnete z instalacijo tega produkta
preberite poglavje: "Opozorilo: Informacije
o varnem rokovanju-preberi pred uporabo,"
SD21-0030. To poglavje opisuje pravilne
postopke za kabliranje,



Внимание: Инструкция по технике безопасности --
Прочсть в первую очередь

Danger Notices

DANGER:

1 To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

PELIGRO:

1 Para evitar la posibilidad de descargas, no conecte o desconecte ningún cable, ni realice ninguna instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.

GEVAAR !

1 Om het gevaar voor elektrische schokken te vermijden, mag u geen kabels aansluiten of loskoppelen en dit product niet installeren, onderhouden of opnieuw instellen tijdens een onweer.

DANGER:

1 Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.

Fare!

1 Undgå elektrisk stød:

Produktet må hverken installeres, vedligeholdes eller omkonfigureres i tordenvejr. Det samme gælder for tilslutning eller afmontering af kabler.

VAARA:

1 Älä kytke tai irrota kaapeleita äläkä asenna tai huolla tätä laitetta tai muuta sen kokoonpanoa ukonilman aikana. Muutoin voit saada sähköiskun.

VORSICHT:

1 Aus Sicherheitsgründen bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs oder Rekonfigurationsarbeiten durchführen.

PERICOLO:

1 Per evitare scosse elettriche, non collegare o scollegare cavi o effettuare installazioni, riconfigurazioni o manutenzione di questo prodotto durante un temporale.

FARE:

1 For å unngå elektrisk støt må ikke kabler kobles til eller fra. Du må heller ikke foreta installering, vedlikehold eller rekonfigurering av dette produktet under tordenvær.

PERIGO:

1 Para evitar possíveis choques eléctricos, não ligue nem desligue cabos, nem instale, repare ou reconfigure a máquina, durante uma trovoadá.

VARNING — LIVSFARA

1 Vid åskväder ska du aldrig ansluta eller koppla ur kablar eller arbeta med installation, underhåll eller omkonfigurering av utrustningen.

PERIGO:

1 Para evitar possíveis choques eléctricos, não ligue nem desligue cabos, nem instale, repare ou reconfigure a máquina, durante uma trovoadá.

危険

感電の危険をさけるため、雷雨の間は、ケーブルの抜き差し、あるいはこの製品の設置、保守、再構成をしないでください。

위험

감전 쇼크의 위험을 피하기 위하여 천둥번개가 치는 동안에는 전원을 연결하거나 또는 끊지 마시고 또한 본 제품의 설치, 수리 및 시스템 재구성을 하지 마시오.

危險

雷雨期間，請勿安裝、維修、重新架構本產品，或連接及拔下任何電纜，以免遭到電擊。

NEBEZPEČÍ!

Za bouřky s výrobkem nijak nemanipulujte: nepřipojujte ani neodpojujte žádné kabely a neprovádějte žádnou instalaci, údržbu ani úpravy. Nebezpečí úrazu elektrickým proudem!

NEVARNOST

Da se izognete udaru električnega toka, ne priključevati oziroma izključevati nikakršnih kablov ali izvajati instalacijo, vzdrževanje, ali rekonfiguracijo te naprave med nevihto.

VESZÉLY!

Az áramütés elkerülése végett elektromos vihar közben ne dugja be és ne húzza ki e termék semmilyen kábelét, illetve ne végezzen azon szerelési, karbantartási vagy újrakonfigurálási munkát.

NIEBEZPIECZEŃSTWO

W celu uniknięcia porażenia prądem nie wolno podłączać lub rozłączać żadnych kabli, ani przeprowadzać instalacji, konserwacji lub rekonfiguracji urządzenia znajdującego się pod napięciem.

ОСТОРОЖНО

Во избежание поражения электрическим током во время грозы запрещается присоединять и отсоединять кабели, устанавливать, обслуживать или реконфигурировать данное изделие.

DANGER:

2 To avoid the possibility of electrical shock, switch power off and unplug the power cord from the outlet before detaching the power cord from the base unit.

PELIGRO:

2 Para evitar la posibilidad de descargas, coloque el interruptor de encendido en la posición de apagado y desenchufe el cable de alimentación del tomacorriente antes de desconectar dicho cable de la unidad base.

GEVAAR:

2 Schakel de IBM 8210 uit en trek het netsnoer uit het stopcontact vooraleer u het netsnoer van de basiseenheid verwijdert, dit om elektrische schokken te vermijden.

DANGER:

2 Pour éviter tout risque de choc électrique, mettez l'IBM 8210 hors tension et débranchez le cordon d'alimentation du socle de prise de courant avant de le débrancher de l'unité de base.

Pas på!

2 Undgå risiko for elektrisk stød!

Sluk for strømmen, og træk netledningen ud af stikket, før du fjerner netledningen fra basisenheden.

VAARA:

2 Välttääksesi sähköiskun vaaran katkaise virta ja irrota verkkojohto pistorasiasta, ennen kuin irrotat verkkojohtoa perusyksiköstä.

DANGER

Pour éviter tout risque de choc électrique, mettez la machine hors tension et débranchez le cordon d'alimentation du socle de prise de courant avant de le débrancher de l'unité de base.

VORSICHT:

2 Aus Sicherheitsgründen das Gerät ausschalten und den Netzstecker ziehen, bevor das Netzkabel von der Grundeinheit gelöst wird.

PERICOLO:

2 Per evitare la possibilità di scosse elettriche, spegnere la macchina e scollegare il cavo di alimentazione dalla presa prima di staccarlo dall'unità base.

FARE:

2 For å unngå faren for elektrisk støt, må du slå av strømmen og koble nettkabelen fra stikkkontakten før du fjerner den fra hovedenheten.

PERIGO:

2 Para evitar a possibilidade de choques eléctricos, desligue o interruptor da corrente eléctrica e retire o cabo de corrente eléctrica da tomada antes de desligar o cabo de corrente eléctrica da unidade base.

VARNING — livsfara:

2 För att undvika elolycksfall ska du slå av strømmen och lossa nätkabeln från eluttaget innan du lossar den från basenheten.

PERIGO:

2 Para evitar a possibilidade de choque elétrico, desligue a força e retire o cabo de força da tomada antes de desligá-lo da unidade básica.

危険

感電の危険をさけるため、電源スイッチを切り、コンセントから電源コードを抜いたあとでベース・ユニットの電源コードを抜くようにしてください。

위험 :

전기적인 충격이 가해지지 않도록, 먼저 전원 스위치를 끄고, 코드 구멍에서 전원 코드를 뺀 후에 장치에서 전원 코드를 뽑으십시오.

危險 !

如要避免可能的電擊，請自基本單元拉掉電源線之前，先關閉電源並自插座拉掉電源線。

NEBEZPEČÍ!

Když je zařízení připojeno k síti, je uvnitř nebezpečné napětí. Před každým zásahem do odkrytého zařízení je třeba se přesvědčit, že je přívodní kabel od sítě odpojen.

NEVARNOST

Da se izognete nevarnosti udara električnega toka, izključite sistem in iztaknite napajalni kabel iz vtičnice, šele nato izločite napajalni kabel iz osnovne enote.

Niebezpieczeństwo!

Aby uniknąć porażenia prądem elektrycznym, przed odłączeniem przewodu zasilającego modułu głównego, należy wyłączyć zasilanie i wyciągnąć przewód zasilający z gniazdka.

ОСТОРОЖНО

Во избежание возможного поражения электрическим током выключите питание и выньте кабель из розетки прежде, чем отсоединять силовой кабель от основного узла.

DANGER:

4 To avoid shock hazard:

- The power cord must be connected to a properly wired and earthed receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

PELIGRO:

4 Para evitar peligro de descargas:

- El cable de alimentación debe estar conectado a una toma de corriente adecuadamente cableada y con toma de tierra.
- Cualquier equipo al que se conecte este producto debe estar también conectado a tomas de corriente adecuadamente cableadas.

GEVAAR !

4 Om elektrische schokken te vermijden:

- moet het netsnoer aangesloten zijn op een correct bedraad en geaard stopcontact.
- moeten alle machines waarmee dit product zal worden verbonden ook op correct bedrade stopcontacten zijn aangesloten.

DANGER:

4 Pour éviter tout risque de choc électrique:

- Le cordon d'alimentation doit être branché sur une prise d'alimentation correctement câblée et mise à la terre.
- D'autre part, tout le matériel connecté à ce produit doit également être branché sur des prises d'alimentation correctement câblées et mises à la terre.

FARE!

4 Undgå elektrisk stød:

- Netledningen skal tilsluttes en korrekt installeret stikkontakt med forbindelse til jord.
- Sørg for korrekt installation af stikkontakterne, både til produktet og til det udstyr, det tilsluttes.

VAARA:

4 Voit saada sähköiskun, jos et noudata seuraavia ohjeita:

- Tämän laitteen verkkojohdon saa kytkeä vain toimintakunnossa olevaan maadoitettuun pistorasiaan.
- Tähän laitteeseen liitettävät laitteet on kytkettävä toimintakunnossa olevaan maadoitettuun pistorasiaan.

DANGER

Pour éviter tout risque de choc électrique :

- les cordons d'alimentation du présent produit et de tous les appareils qui lui sont connectés doivent être branchés sur des socles de prise de courant correctement câblés et mis à la terre.

VORSICHT

4 Aus Sicherheitsgründen

- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.

PERICOLO:

4 Per evitare scosse elettriche:

- Il cavo di alimentazione deve essere collegato a una presa munita di terra di sicurezza e propriamente cablata.
- Tutte le unità esterne di questo prodotto, devono essere collegate a prese munite di terra di sicurezza e propriamente cablate.

FARE:

4 For å unngå elektrisk støt:

- Nettkabelen må være plugget i en korrekt koblet og jordet stikkontakt.
- Alt utstyr som er koblet til dette produktet må være plugget i en korrekt koblet stikkontakt.

PERIGO:

4 Para evitar choques eléctricos:

- O cabo de alimentação tem de estar ligado a uma tomada de corrente correctamente instalada e com ligação à terra.
- Todo o equipamento ligado a esta máquina também deve estar ligado a tomadas correctamente instaladas.

VARNING — LIVSFARA

4 För att undvika elolycksfall:

- Nätkablen måste anslutas till ett rätt kopplat jordat eluttag.
- Även annan utrustning som ska anslutas till den här produkten måste anslutas till jordat uttag.

PERIGO:

4 Para evitar choques eléctricos:

- O cabo de alimentação tem de estar ligado a uma tomada de corrente correctamente instalada e com ligação à terra.
- Todo o equipamento ligado a esta máquina também deve estar ligado a tomadas correctamente instaladas.

危険

感電防止のため

- 電源ケーブルは、正しく配線された接地（アース）極付きコンセントに接続してください。
- この製品が接続される機器もすべて正しく配線されたコンセントに接続してください。

위험

감전 쇼크의 위험을 피하기 위하여:

- 전원은 반드시 적정 규격의 전선을 사용하고 접지선이 연결된 접속기와 연결 하십시오.
- 본 제품과 연결되는 모든 기기는 반드시 적정 규격의 전선으로 접지선이 연결된 접속기와 연결되어 있어야 합니다.

危險！

如要避免電擊，則

- 電源線必須連接至確實鎖緊且接地的插座上。
- 本產品所要附加的任何設備，也必須連接至確實鎖緊的插座上。

NEBEZPEČÍ!

Přívodní kabel smí být připojen pouze ke správně zapojené a uzemněné zásuvce.

- Také každé zařízení, ke kterému je tento výrobek připojen, smí být připojeno pouze ke správně zapojené zásuvce.
- V opačném případě hrozí nebezpečí úrazu elektrickým proudem.

Nebezpečenstvo:

Aby sa predišlo hazardu elektrického šoku:

1. sieťová šnúra musí byť zapojená do správne zapojenej a uzemnenej zásuvky.
2. každé iné zariadenie, ktoré bude pripojené na daný produkt, musí byť tiež zapojený na správne pripojené zásuvky.

NEVARNOST

Da se izognete udaru električnega toka:

- Napajalni kabel mora biti priključen v pravilno instalirano in ozemljeno vtičnico.
- Katerakoli druga oprema, na katero se veže ta sistem, mora biti ravno tako pravilno priključena v ustrezno vtičnico.

VESZÉLY!

Az áramütés elkerülése végett:

- A hálózati csatlakozószinórt megfelelően bekötött és földelt dugaszolóaljzatba kell csatlakoztatni.
- Minden olyan berendezést megfelelően bekötött dugaszolóaljzatba kell csatlakoztatni, amelyhez a terméket kapcsolja.

UWAGA

Aby uniknąć porażenia prądem elektrycznym:

- Wtyczka musi być podłączona do prawidłowo zainstalowanego i uziemionego gniazdka.
- Wszystkie inne urządzenia, z którym to urządzenie jest połączone, muszą być podłączone do prawidłowo zainstalowanych gniazdek.

ОСТОРОЖНО

Во избежание поражения электрическим током:

- o Кабель питания должен быть присоединён к электрической розетке, каблированной и заземлённой надлежащим образом.
- o Всё оборудование, к которому будет подключено данное изделие, также должно быть присоединено к электрическим розеткам, каблированным надлежащим образом.

DANGER:

5 Hazardous voltages exist inside this machine when it is powered on. Anytime you service this unit with the cover off, be sure to unplug the power cord.

PELIGRO:

5 Aun cuando está apagada, hay voltajes peligrosos en esta máquina. Siempre que dé servicio a esta máquina sin la cubierta, asegúrese de desenchufar el cable de alimentación.

GEVAAR:

5 Er bevindt zich gevaarlijke spanning binnenin deze machine, wanneer ze is ingeschakeld. Telkens als u onderhoud uitvoert op deze eenheid, met de behuizing verwijderd, moet u het netsnoer loskoppelen.

DANGER:

5 Tension dangereuse à l'intérieur de la machine lorsque celle-ci est sous tension. Avant toute intervention à l'intérieur, débranchez le cordon d'alimentation.

FARE!

5 Der er høj spænding i denne maskine, når den er tændt. Træk derfor altid netledningen ud, når enheden skal efterses.

VAARA: 5 Virran ollessa kytkettynä koneen sisällä on vaarallisia jännitteitä. Muista aina irrottaa verkkojohto, jos huollat konetta sen suojakannen ollessa irrotettuna.

VORSICHT:

5 Bei eingeschaltetem Gerät liegen im Innern gefährliche Spannungen an. Sicherstellen, daß bei Arbeiten an der geöffneten Maschine der Netzstecker gezogen ist.

PERICOLO:

5 Quando la macchina è alimentata, vi sono tensioni pericolose all'interno. Ogni volta che si effettuano interventi di manutenzione, se il coperchio non è inserito, scollegare il cavo di alimentazione.

FARE:

5 Det er farlig spenning inni maskinen når den er slått på. Hver gang du utfører service på maskinen mens dekslet er tatt av, må du huske på å trekke ut nettkabelen.

PERIGO:

5 Este equipamento, quando ligado, apresenta tensões perigosas no seu interior. Sempre que proceda a assistência nesta unidade com a cobertura retirada, certifique-se que o cabo de alimentação da unidade se encontra desligado.

VARNING — LIVSFARA:

5 Farliga spänningar i maskinen när den är påslagen. Se till att nätkabeln är urkopplad innan du öppnar enheten.

PERIGO:

5 Existem voltagens perigosas no interior desta máquina quando ela está ligada. Toda vez que você for fazer a manutenção desta unidade com a tampa aberta, certifique-se de desconectar o cabo de força.

DANGER:

5 Une tension dangereuse existe dans cette machine lorsqu'elle est branchée. Déconnectez toujours le cordon d'alimentation avant de retirer le couvercle, lorsque vous effectuez des procédures de maintenance.

5

VESZÉLY!

Bekapcsolt állapotban a gépen belül veszélyes feszültségek lépnek fel. Amikor a készüléket eltávolított fedél mellett javítja, feltétlenül húzza ki a hálózati csatlakozószinórt.

5

危険:

電源投入中は、内部に危険な電圧がかかっています。カバーを開けて保守作業をする場合は、必ず電源コードを抜いてから行ってください。

5

위험:

기계를 켤때 위험한 전압이 흐를 수 있으니 조심하십시오.

5

危險:

本機器電源開啓時有高壓電。
如需打開機蓋維修機器，請務必先把電源線的插頭拔掉。

5

Uwaga wysokie napięcie!

Przed zdjęciem obudowy, należy wyłączyć przewód zasilający z gniazdka.

5

Осторожно:

При включенном питании в устройстве имеется напряжение, опасное для жизни. При обслуживании устройства со снятой крышкой отсоедините кабель питания.

5

OPASNO

Unutar ovog uređaja prilikom njegovog uključivanja u mrežu nastaje opasan napon. Svaki put kad radite s ovim uređajem s otvorenim poklopcem morate biti sigurni da mrežna žica nije spojena s priključnicom.

5

NEBEZPEČÍ!

Když je zařízení připojeno k síti, je uvnitř nebezpečné napětí. Před každým zásahem do odkrytého zařízení je třeba se přesvědčit, že je přívodní kabel od sítě odpojen.

5

NEBEZPEČENSTVO!

Keď je zariadenie pripojené na sieť, je vo vnútri nebezpečné napätie. Pred každým zásahom do odkrytého zariadenia je potrebné sa presvedčiť, že prívodný kábel je odpojený od siete.

Caution Notices



Cuidado:

Você deve segurar a unidade de base enquanto estiver removendo os parafusos para evitar que caiam no chão ou em outro equipamento abaixo dela no rack. A unidade pesa aproximadamente 6.7 kg (14.5 lb).



警告：

您在拆除螺钉时，必须支持基本部件，以避免它跌在地上，或在它之下其他停放在机架上的设备。这部件大约重 6.7公斤（14.5磅）。



OPREZ:

Potrebno je pridrzavati sistemsku jedinicu dok skidate vijke da bi sprijecili moguci pad na pod ili na druge uredaje smjestene u ormaru ispod nje. Sistemska jedinica je teska otprilike 6.7 kg (14.5 funti)



Při odstraňování šroubů podpírejte základní jednotku tak, aby nepadla na zem nebo na jiné zařízení pod stojanem. Tato jednotka váží asi 6.7 kg (14.5 lb).



Pas på!

Undgå at tabe basisenheden på gulvet eller ned i udstyr monteret under den i racket: Understøt basisenheden, mens du fjerner skruerne. Enheden vejer ca. 6,7 kg.



ATTENTIE:

Tijdens het verwijderen van de schroeven moet u de basiseenheid ondersteunen, om te voorkomen dat deze op de grond of op de andere apparatuur in het rek valt. De eenheid weegt ongeveer 6,7 kg.



Varoitus:

Tue keskusyksikköä, kun irrotat ruuveja. Muutoin se voi pudota lattialle tai telineen muiden laitteiden päälle. Keskusyksikkö painaa noin 6,7 kiloa.



Attention :

L'unité de base pèse 6,7 kg. Lorsque vous en desserrez les vis, maintenez-la fermement pour éviter qu'elle ne tombe à terre ou sur un autre équipement de l'armoire.



ACHTUNG

Die Basiseinheit beim L]sen der Schrauben unbedingt festhalten.

Die Basiseinheit wiegt etwa 6,7 kg.



FIGYELMEZTETÉS!

Fogja meg jól az alap egységet a csavarok kicsavarásakor, hogy elkerülje annak a padlóra vagy a keretben alatta lévő más berendezésre esését! Az egység tömege kb. 6,7 kg (14.5 lb). (Lásd a "Biztonsági figyelmeztetések" A Függelékében a 3-as FIGYELMEZTETÉS fordítását!)



Attenzione Occorre sostenere l'unità di base durante la rimozione delle viti per evitare che tale unità cada sul pavimento o su un'altra apparecchiatura posta sotto il rack. L'unità pesa approssimativamente 6,7 kg.



注意:
ねじを取り外している間は、装置が床の上に落下したり、あるいはラック内の他の機器の上に落下したりしないように、必ず装置をささえておく必要があります。装置の最大重量は 6.7 kg です。



주의 :

나사들이 바닥이나 랙 안의 다른 장비에 떨어지지 않도록 장치에서 나사들이 제거되는 동안에 장치를 지지해야 합니다. 장치의 무게는 약 6.7kg (14.5lb) 입니다.



Advarsel:

Du må støtte opp hovedenheten mens du tar ut skruene så den ikke faller i gulvet eller ned på annet utstyr som er lenger ned i kabinettet. Enheten veier ca. 6,7 kg.



UWAGA:

Podczas wykręcania śrub jednostkę podstawową należy podtrzymywać, aby nie upadła na podłogę lub inne urządzenia położone pod nią w stelażu. Jednostka ma masę oko

A "Informacje o bezpieczeń



Cuidado:

Deve segurar a unidade de base enquanto remove os parafusos, de modo a evitar que a unidade caia no chão ou sobre outro equipamento que se encontre instalado abaixo dela, no bastidor. A unidade pesa aproximadamente 6,7 Kg.



Výstraha:

Je potrebné podoprieť základnú systémovú jednotku počas odstraňovania skrutiek, aby sa predišlo pádu častí zariadenia na zem alebo na skriňu. Hmotnosť základnej systémovej jednotky je približne 6,7 kg (14,5lb).



Nebezpečnostvo:

Aby sa predišlo hazardu elektrického šoku:

1. sieťová šnúra musí byť zapojená do správne zapojenej a uzemnenej zásuvky.
2. každé iné zariadenie, ktoré bude pripojené na daný produkt, musí byť tiež zapojený na správne pripojené zásuvky.



Precaución:

Debe sostener la unidad base mientras está quitando los tornillos para evitar que caiga al suelo o sobre otro de los equipos del bastidor. La unidad pesa 6,7 Kg. (14,5 lb). Consulte el apartado PRECAUCIÓN del Apéndice A "Información de Seguridad" para transformaciones



VARNING:

När du tar bort skruvarna måste du hålla i basenheten så att den inte faller ner på golvet eller på annan utrustning i racket. Enheten väger nästan 7 kg.



注意：

當您要移動螺絲時，必需要撐著此基本裝置以避免它掉落在地板上或架子下的其它設備。此基本裝置重約 6.7 公斤（145 磅）。

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United Kingdom Homologation Compliance Statement

STATEMENT OF COMPLIANCE

The United Kingdom Telecommunications Act 1984. This equipment is approved under General Approval Number

NS/G/1234/J/100003

for indirect connections to the public telecommunications systems in the United Kingdom.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors (IBM part number 55H8694 or its equivalent for the data/fax/voice modem, or IBM part number 72H4447 or equivalent for the data/fax modem) must be used in order to meet the FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2)

this device must accept any interference received, including interference that may cause undesired operations.

Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union (EU) Mark of Conformity Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

Properly shielded and grounded cables and connectors (IBM part number 72H4447 or its equivalent for the data/fax modem) must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Hinweis: Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

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Warning: This product is a Class 1 Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Australian and New Zealand Radiocommunications (Radio) Regulations

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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NetView	Nways	PowerPC
RISC/6000	System Application Archi- tecture (SAA)	System/38

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Machine: 8210 MSS Server or MSS Server Module

Warranty Period*: 1 Year

**Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if authorized by IBM, will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

For IBM or your reseller to provide warranty service for a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many of these transactions involve the removal of parts and their return to IBM. You represent that all removed parts are genuine and unaltered. A part that replaces a removed part will assume the warranty service status of the replaced part.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair it or replace it with one that is at least functionally equivalent, without charge. The replacement may not be new, but will be in good working order. If IBM or your reseller is unable to repair or replace the Machine, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user. However, for Machines which have a life-time warranty, this warranty is not transferable.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-IBM-SERV (426-7378)**. In Canada, call IBM at **1-800-465-6666**. You may be required to present proof of purchase.

IBM or your reseller will provide certain types of repair and exchange service, either at your location or at IBM's or your reseller's service center, to restore a Machine to good working order.

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You agree to:

1. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
2. where applicable, before service is provided —
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
 - b. secure all programs, data, and funds contained in a Machine, and
 - c. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

The warranties may be voided by misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal or alteration of Machine or parts identification labels, or failure caused by a product for which IBM is not responsible.

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Appendix C. Parts Listings

This appendix contains a reference drawing and a corresponding index for all field-replaceable units. The index provides the part number, the quantity required (units), and a description of the part. Separate indexes lists the FRUs for the 8210 MSS Server or the MSS Server Module.

This parts catalog contains reference drawings and a corresponding index for all field replaceable parts. The index provides the part number, the quantity required (units), and a description of the part.

Listed below is additional information about the parts assembly index.

- **SIMILAR ASSEMBLIES:** If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.

- **AR:** (As Required) in the Units column indicates that the quantity is not the same for all machines.

- **NP:** (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.

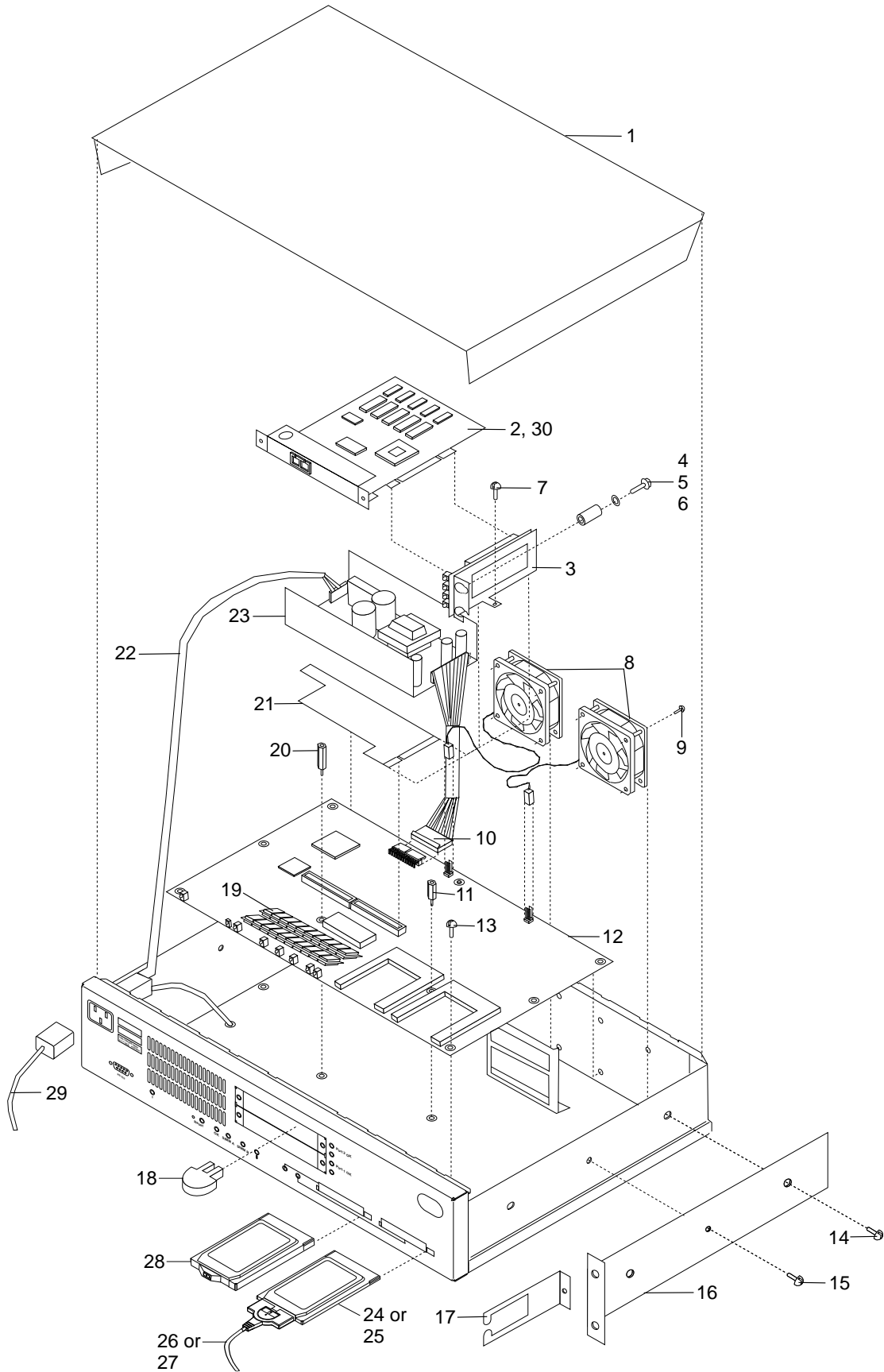
- **NR:** (Not Recommended) in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.

- **R:** (Restricted) in the Units column indicates the part has a restricted availability.

- **INDENTURE:** The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

Indenture	Relationship of Parts
(No dot)	MAIN ASSEMBLY
(One dot)	• Detail parts of a main assembly
(One dot)	• Subassembly of the main assembly
(Two dots)	• • Detail part of a one-dot subassembly
(Two dots)	• • Subassembly of a one-dot subassembly
(Three dots)	• • • Detail part of a two-dot subassembly

Assembly 1: Final Assembly, 8210 Nways MSS Server

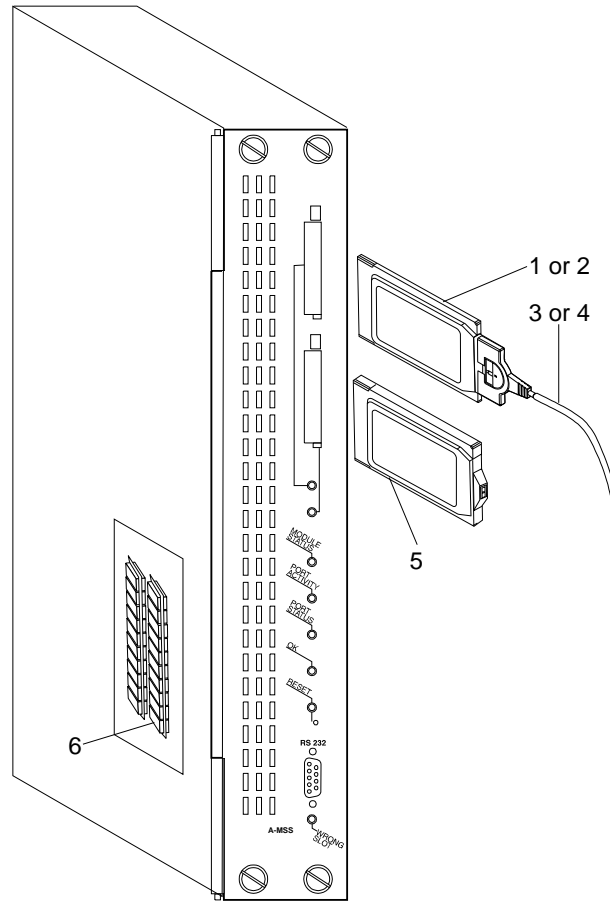


Asm- Index	Part Number	Units	Description
1-1		NP	Final Assembly - 8210 MSS Server
-1		NP	Cover (for illustration only)
-2	85H3586	1	155 MM ATM Adapter
-	85H3587	1	155 SM ATM Adapter
-3	85H3582	1	Riser Card
-4	10H4437	2	Spacer (10H4437)
-5	1622319	2	Washer (M5, 1622319)
-6	1621813	2	Screw (M4 x 16)
-7	33G3907	1	Screw (M3 x 5)
-8	85H3579	2	Fan
-9	33G3907	8	Screw (M3 x 5)
-10	85H3584	1	DC Power Cable
-11	72H3640	1	Standoff spacer (12MM)
-12	85H3580	1	Processor Logic Card
-13	33G3907	AR	Screw (M3 x 5)
-14	92G8546	4	Screw (M4 x 8)
-15	42H1345	2	Screw (M4 x 6 Torx)
-16		NP	Rack mounting bracket (illustration only)
-17		NP	Cable mounting bracket (illustration only)
-18	85H3588	1	Wrap plug kit
-19	41H7107	AR	16 MB 72-Pin DRAM SIMM
-20	92G6750	1	Standoff spacer (18MM)
-21	85H3581	1	PCI Logic Card
-22	85H3584	1	AC Power Cable
-23	85H3578	1	Power Supply
-24	85H3572	1	PCMCIA Data/Fax/Voice Modem - US/Canada
-25	85H3549	AR	PCMCIA Data/Fax/ Modem Programmed for US/Canada
-	85H3550	AR	PCMCIA Data/Fax/ Modem Programmed for Austria
-	85H3551	AR	PCMCIA Data/Fax/ Modem Programmed for Australia
-	85H3552	AR	PCMCIA Data/Fax/ Modem Programmed for Belgium
-	85H3553	AR	PCMCIA Data/Fax/ Modem Programmed for Denmark
-	85H3554	AR	PCMCIA Data/Fax/ Modem Programmed for Finland
-	85H3555	AR	PCMCIA Data/Fax/ Modem Programmed for France
-	85H3556	AR	PCMCIA Data/Fax/ Modem Programmed for Germany
-	85H3557	AR	PCMCIA Data/Fax/ Modem Programmed for Hong Kong
-	85H3558	AR	PCMCIA Data/Fax/ Modem Programmed for Ireland
-	85H3559	AR	PCMCIA Data/Fax/ Modem Programmed for Italy
-	85H3560	AR	PCMCIA Data/Fax/ Modem Programmed for Japan
-	85H3561	AR	PCMCIA Data/Fax/ Modem Programmed for Korea
-	85H3562	AR	PCMCIA Data/Fax/ Modem Programmed for Luxemborg
-	85H3563	AR	PCMCIA Data/Fax/ Modem Programmed for Netherlands
-	85H3564	AR	PCMCIA Data/Fax/ Modem Programmed for New Zealand
-	85H3565	AR	PCMCIA Data/Fax/ Modem Programmed for Norway
-	85H3566	AR	PCMCIA Data/Fax/ Modem Programmed for Singapore
-	85H3567	AR	PCMCIA Data/Fax/ Modem Programmed for S. Africa
-	85H3568	AR	PCMCIA Data/Fax/ Modem Programmed for Spain
-	85H3569	AR	PCMCIA Data/Fax/ Modem Programmed for Sweden
-	85H3570	AR	PCMCIA Data/Fax/ Modem Programmed for Switzerland
-	85H3571	AR	PCMCIA Data/Fax/ Modem Programmed for UK
-26	85H3589	1	PCMCIA Data/Fax Modem Cable
-27	85H3590	1	PCMCIA Data/Fax/Voice Modem Cable

Parts Listing

	-28	06H8956	1	PCMCIA Hard Drive
	-29	10H5553	AR	Power cord (9 ft. 100-125V)
	-	10H5554	AR	Power cord (6 ft. 100-125V)
	-	10H5555	AR	Power cord (9 ft. 230-240V)
	-	10H5556	AR	Power cord (6 ft. 200)
	-	10H5557	AR	Power cord (9 ft. 200-250V)
	-	10H5558	AR	Power cord (9 ft. 200-220V)
	-	10H5559	AR	Power cord (9 ft. 230-240V)
	-	10H5560	AR	Power cord (9 ft. 230-240V)
	-	10H5561	AR	Power cord (9 ft. 230-240V)
	-	10H5562	AR	Power cord (9 ft. 230-240V)
	-	10H5563	AR	Power cord (9 ft. 200-220V)
	-	10H5564	AR	Power cord (9 ft. 200-220V)
	-	10H5565	AR	Power cord (9 ft. 230-240V)
	-30	72H3676	1	Dual Ring optical fiber FDDI adapter

Assembly 2: Final Assembly, Nways MSS Server Module



Asm- Index	Part Number	Units	Description
2-2	85H3576	NP	Final Assembly - MSS Server (no memory, no PCMCIA devices)
-1	85H3572	1	PCMCIA Data/Fax/Voice Modem - US/Canada
-2	85H3549	AR	PCMCIA Data/Fax/ Modem Programmed for US/Canada
-	85H3550	AR	PCMCIA Data/Fax/ Modem Programmed for Austria
-	85H3551	AR	PCMCIA Data/Fax/ Modem Programmed for Australia
-	85H3552	AR	PCMCIA Data/Fax/ Modem Programmed for Belgium
-	85H3553	AR	PCMCIA Data/Fax/ Modem Programmed for Denmark
-	85H3554	AR	PCMCIA Data/Fax/ Modem Programmed for Finland
-	85H3555	AR	PCMCIA Data/Fax/ Modem Programmed for France
-	85H3556	AR	PCMCIA Data/Fax/ Modem Programmed for Germany
-	85H3557	AR	PCMCIA Data/Fax/ Modem Programmed for Hong Kong
-	85H3558	AR	PCMCIA Data/Fax/ Modem Programmed for Ireland
-	85H3559	AR	PCMCIA Data/Fax/ Modem Programmed for Italy
-	85H3560	AR	PCMCIA Data/Fax/ Modem Programmed for Japan
-	85H3561	AR	PCMCIA Data/Fax/ Modem Programmed for Korea
-	85H3562	AR	PCMCIA Data/Fax/ Modem Programmed for Luxemborg
-	85H3563	AR	PCMCIA Data/Fax/ Modem Programmed for Netherlands
-	85H3564	AR	PCMCIA Data/Fax/ Modem Programmed for New Zealand
-	85H3565	AR	PCMCIA Data/Fax/ Modem Programmed for Norway
-	85H3566	AR	PCMCIA Data/Fax/ Modem Programmed for Singapore
-	85H3567	AR	PCMCIA Data/Fax/ Modem Programmed for S. Africa
-	85H3568	AR	PCMCIA Data/Fax/ Modem Programmed for Spain
-	85H3569	AR	PCMCIA Data/Fax/ Modem Programmed for Sweden
-	85H3570	AR	PCMCIA Data/Fax/ Modem Programmed for Switzerland
-	85H3571	AR	PCMCIA Data/Fax/ Modem Programmed for UK
-3	85H3589	1	PCMCIA Data/Fax Modem Cable
-4	85H3590	1	PCMCIA Data/Fax/Voice Modem Cable
-5	06H8956	1	PCMCIA Hard Drive
-6	60G2950	AR	16 M 72-Pin DRAM SIMM

Parts Listing

Appendix D. Firmware Error Codes

The error log which is displayed when you use the Displaying the Error Log firmware utility (See “Displaying the Error Log” on page 4-14) contains error codes. This appendix contains explanations for those error codes.

Error Code	Physical Location	Software Subsystem	Explanation
00010000	Processor	Processor	Processor Test Failure
00011000	System Board	NVRAM	Non-volatile RAM Test Failure
00015001	System Board	Firmware Flash	An error occurred while erasing the system firmware.
00015002	System Board	Firmware Flash	An error occurred while updating the system firmware.
00015500	System Board	Interrupts	System board interrupt test failure.
00015501	System Board	Interrupts	Error occurred during processor interrupt tests.
00015502	System Board	Interrupts	Error occurred during real time clock interrupt tests.
00015503	System Board	Interrupts	Error occurred during timer interrupt tests.
00016000	System Board	RTC-NVRAM	CRC error.
00016002	System Board	RTC-NVRAM	Read/Write failure.
00017001	System Board	RTC-NVRAM	Battery drained.
00017006	System Board	RTC-NVRAM	Security data missing or lost.
00017007	System Board	Security	Maximum unsuccessful attempts to enter password was reached.
00018000	System Board	Firmware	Firmware code image is corrupted.
000210y0	System Board	Thermal	Thermal sensor interrupt error. where yy> = 0x0F = Unexpected consecutive interrupts z = Non zero bits indicate failing interrupt 3 = Above shutdown temperature 2 = Below shutdown temperature 1 = Below warning temperature 0 = Above warning temperature
2209E000	System Board	Thermal sensor	Thermal sensor configuration error occurred.
2259E000	System Board	Thermal	Thermal sensor interrupt error occurred.
2269E0xx	System Board	Thermal	Thermal sensor over-temperature. Temperature = xx degrees Celsius in hexadecimal.
50000000	System Board	PCMCIA	PCMCIA controller error.
50001100		Firmware manager	The level of System Management Services does not match the level of system firmware.
710sdddd	155 MB MMF adapter in slot "s"	ATM diagnostic	Failure of ATM adapter. dddd=detailed status
720sdddd	155 MB MMF adapter in slot "s"	ATM diagnostic	Failure of ATM adapter. dddd=detailed status
740sdddd	MSS Server	ATM diagnostic	Failure of the ATM interface to the 8260. dddd=detailed status
750sdddd	FDDI adapter in slot 's'	FDDI diagnostics	Failure of FDDI adapter dddd=detailed status
7mscedddd	PCI slots		Adapters m=unique for adapter type s=subtest, c=slot id, e=error id, ddd=debug

Error Code	Physical Location	Software Subsystem	Explanation
80000000	—	—	Timeout waiting for Echo Test for 8260 MSS module only.
80100001	System Board	8260 Mailbox memory	Error occurred while testing page 1 of 8260 Mailbox memory. *
80100010	System Board	8260 Mailbox memory	Error occurred while testing page 2 of 8260 Mailbox memory.
801000xy	System Board	Mailbox memory	Error testing mailbox memory x = indicates page 2 error y = indicates page 1 error
81000ddd	System Board	Main Flash	Error occurred while reading flash page ddd.
81100ddd	System Board	Main Flash	Error occurred while writing flash page ddd.

Appendix E. 8210 MSS Server Characteristics

This appendix describes physical characteristics of the 8210 MSS Server. Similar information about the MSS Server Module is not included because it fits into the 8260 Nways Multiprotocol Switching Hub. The MSS Server Module is connected to the ATM network when it is installed in the 8260.

Power Characteristics

The ac power cord connector is in the front of the 8210 MSS Server. The 8260 Nways Multiprotocol Switching Hub supplies power to the MSS Server Module.

Physical Characteristics

The dimensions and weight of the 8210 MSS Server are as follows:

Width	440 mm (17.3 in.) without rack mounting flanges 480 mm (18.9 in.) with rack mounting flanges
Depth	358 mm (14.1 in.)
Height	2u (92,1 mm [3.63 in.] from the top of the 8210 MSS Server to the top of the next machine that is mounted in the rack)
Weight	6,7 kg (14.7 lb.) with two ATM Adapters

Space Requirements

The 8210 MSS Server can be rack- or surface-mounted. It should have at least 100 mm (4.0 in.) minimum clearance at the rear and 300 mm (11.8 in.) clearance at the front. The air flow for ventilation is from front to back.

Environmental Requirements

Characteristics of the surrounding environment in which the 8210 MSS Server will operate are shown as follows:

Power-On Temperature	10°C—40°C (50°F—104°F)
Storage Temperature	1°C—60°C (33°F—140°F)
Relative Humidity	8%—80%
Wet Bulb	27°C (81°F)
Caloric value	46.5 Kcal/hr (184 BTU/hr)
Capacity of Exhaust	0.566 Cubic meter/min. (20 cubic ft/min.)
Electrical power	0.107 kilovolt-amperes (kVA)
Starting Current	less than 40 A
Leakage Current	1.5 mA maximum
Noise Level	44 dB

Over-temperature Condition

If the temperature in the 8210 MSS Server exceeds the operating (Power-On) temperature, it will shut down and the over-temperature LED will come on. The 8210 MSS Server will restart when the temperature inside the 8210 MSS Server returns to the Power-On operating range.

An over-temperature condition could indicate that the cooling fans have malfunctioned or an abnormally high room temperature where the 8210 MSS Server is located.

Acoustic Characteristics

The following table is a declaration of the MSS Server noise emission characteristics.

Table E-1. Declaration of IBM Product Noise Emission Values

Type	Description	LwAd		LpAm		<LpA>m	
		Operating (bels)	Idling (bels)	Operating (dB)	Idling (dB)	Operating (dB)	Idling (dB)
8210	MSS Server	4.8	4.8	N/A	N/A	44	44

Notes:

LwAd is the declared (upper limit) sound power level for a random sample of machines.

LpAm is the mean value of the A-weighted sound pressure levels at the operator position (if any) for a random sample of machines.

<LpA>m is the mean value of the A-weighted sound pressure levels at the one-meter (bystander) positions for a random sample of machines.

N/A Indicates "not applicable" (that is, having no defined operator position.)

All measurements were made in accordance with ANSI S12.10 and reported in conformance with ISO DIS 9296. These are preliminary values and are subject to change. The final values will be available from IBM Manufacturing for production machines.

Pin Assignments for the Service Port

Both the 8210 MSS Server and the MSS Server Module have one standard service port: an EIA 232 female 9-pin D-shell connector that is capable of operating at up to 57.6 Kbps. It can be attached locally through a null-modem cable, or remotely through a modem attachment. The service port is provided so that you can access the MSS Server to perform configuration or maintenance. The default line speed is 19.2 kbps.

Figure E-1 shows the pin assignments for the service port connector. Connectors for the MSS Server and the blade are identical.

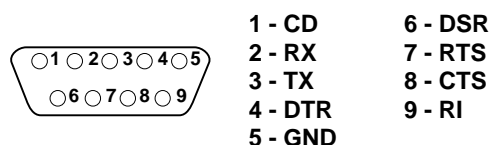


Figure E-1. Service Port Pin Assignments

Appendix F. 8210 Nways MSS Server LED Indicators

This appendix describes the light emitting diodes (LED) indicators for the 8210 MSS Server.

Generally, errors occurring *before* the operational code is loaded are hardware-related. LEDs on the front of the MSS Server reflect the status of the hardware components within the MSS Server Module.

Figure F-1 shows the locations of the LEDs, and Table F-1 indicates the meanings of the LEDs.

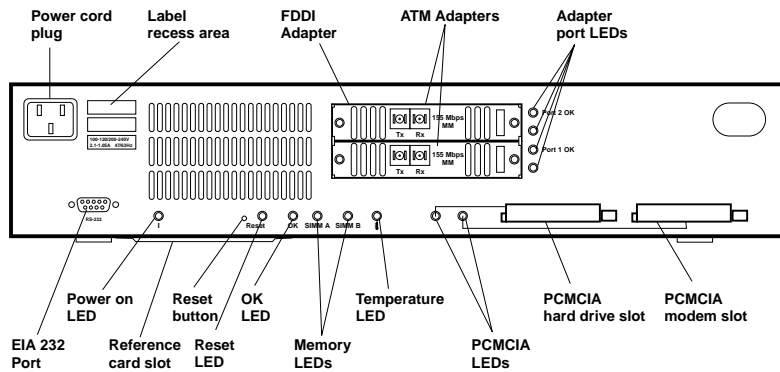


Figure F-1. Front Panel of the MSS Server

Table F-1 (Page 1 of 2). Meanings of the 8210 MSS Server LEDs

LED	Color	State	Explanation
I (Power On)	Green	ON	There is ac power to the 8210 MSS Server and the power supply is OK.
		OFF	No ac power is present, or there is a power supply failure.
Reset	Yellow	ON	System reset is in progress. The LED remains on until the reset is complete.
		OFF	System reset is complete.
OK	Green	ON	Hardware logic components are OK.
		OFF	System fault. Push Reset button. If still OFF, there is a system fault.
		Blinking	Operational code load is in progress.
SIMM A or B	Yellow	ON	Memory module (SIMM A or B) fault.
		OFF	Memory module (SIMM A or B) OK.
Temperature symbol	Yellow	ON	The 8210 MSS Server has an over-temperature condition (See Appendix E, "8210 MSS Server Characteristics" on page E-1).
		OFF	The 8210 MSS Server operating temperature is within the normal range.
PCMCIA slots 1 or 2	Yellow	ON	A PCMCIA device is absent, is not seated correctly, or is faulty.
		OFF	A PCMCIA device is present and is seated correctly.

Table F-1 (Page 2 of 2). Meanings of the 8210 MSS Server LEDs

LED	Color	State	Explanation
Adapter Ports 1 or 2	Green	ON	An adapter is in the port, configured, enabled, and operational.
		OFF	The adapter is not configured, not enabled, or not operational; or, no adapter is in the port.
	Yellow	ON (not blinking)	The adapter in the port has failed.
		ON (blinking)	There is a potential network problem, or problem with the adapter.
		OFF	No problem is detected in the adapter, or no adapter is in the port.

Problem Solving

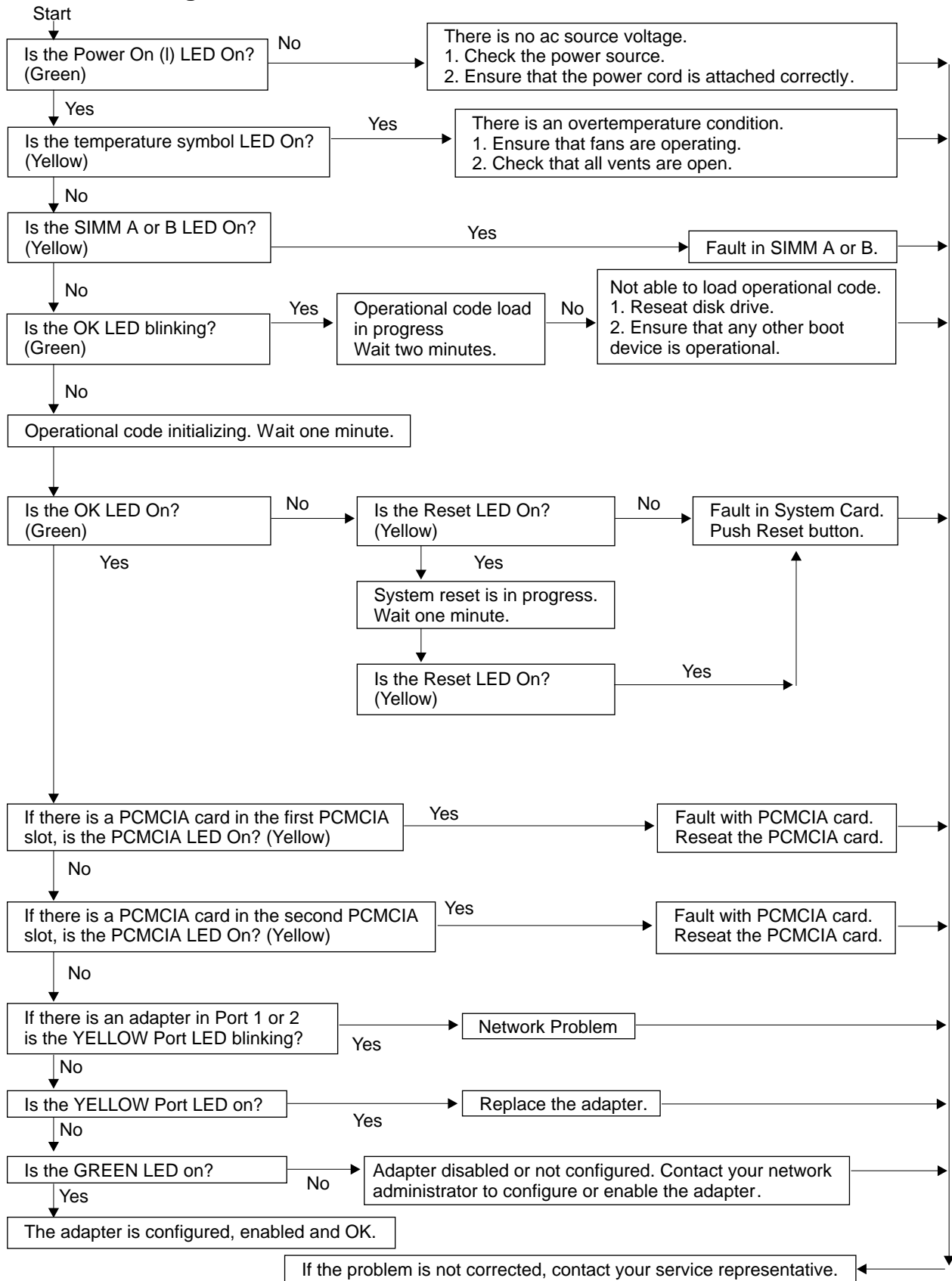


Figure F-2. Problem Solving for the MSS Server

Appendix G. MSS Server Module LED Status Indicators

This appendix describes the light emitting diode (LED) status indicators for the MSS Server Module.

Generally, errors occurring *before* the operational code is loaded are hardware-related. LEDs on the front of the MSS Server Module reflect the status of the hardware components within the MSS Server Module.

Figure G-1 shows the locations of the LEDs, and Table G-1 indicates the meanings of the LEDs.

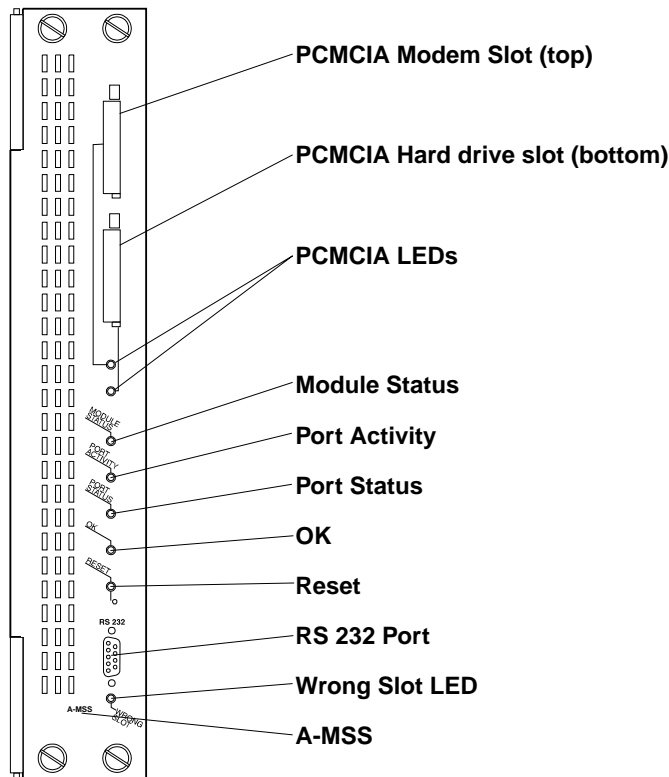


Figure G-1. Front Panel of the MSS Server Module

Table G-1 (Page 1 of 2). Meanings of the MSS Server Module LEDs

LED	Color	State	Indicates
Module Status	Green	ON	Module is logically connected to the hub ATM backplane.
		OFF	Module is not logically connected to the hub ATM backplane. Use SET MODULE slot CONNECTED (where the value for <i>slot</i> indicates the leftmost position of the module and can be 1 to 8, or 12 to 17).
		Blinking	Module is powered on, but diagnostics have failed.
Port Activity	Yellow	ON	This yellow LED could be on or off depending whether there is traffic flowing to the MSS Server Module.
		OFF	This yellow LED could be on or off depending whether there is traffic flowing to the MSS Server Module.

Table G-1 (Page 2 of 2). Meanings of the MSS Server Module LEDs

LED	Color	State	Indicates
Port Status	Green	ON	The ATM backplane port is enabled.
		OFF	The ATM backplane port is not enabled. Use SET PORT slot.1 ENABLED (where the value for <i>slot</i> indicates the leftmost position of the module and can be 1 to 8, or 12 to 17).
OK	Green	ON	Hardware logic components are OK.
		OFF	System fault. Push Reset button.
		Blinking	Operational code load in progress.
Reset	Yellow	ON	System reset is in progress.
		OFF	System reset is complete.
Wrong Slot	Yellow	ON	The MSS Server Module is in an incorrect module slot (slots 9, 10, or 11).
		OFF	The MSS Server Module is in the correct slot and is correctly seated.
PCMCIA Slot (Top)	Yellow	ON	The PCMCIA modem is absent or is not seated correctly.
		OFF	A PCMCIA modem is present and is seated correctly.
PCMCIA Slot (Bottom)	Yellow	ON	The PCMCIA hard drive is absent or is not seated correctly.
		OFF	A PCMCIA hard drive is present and is seated correctly.

Problem Solving

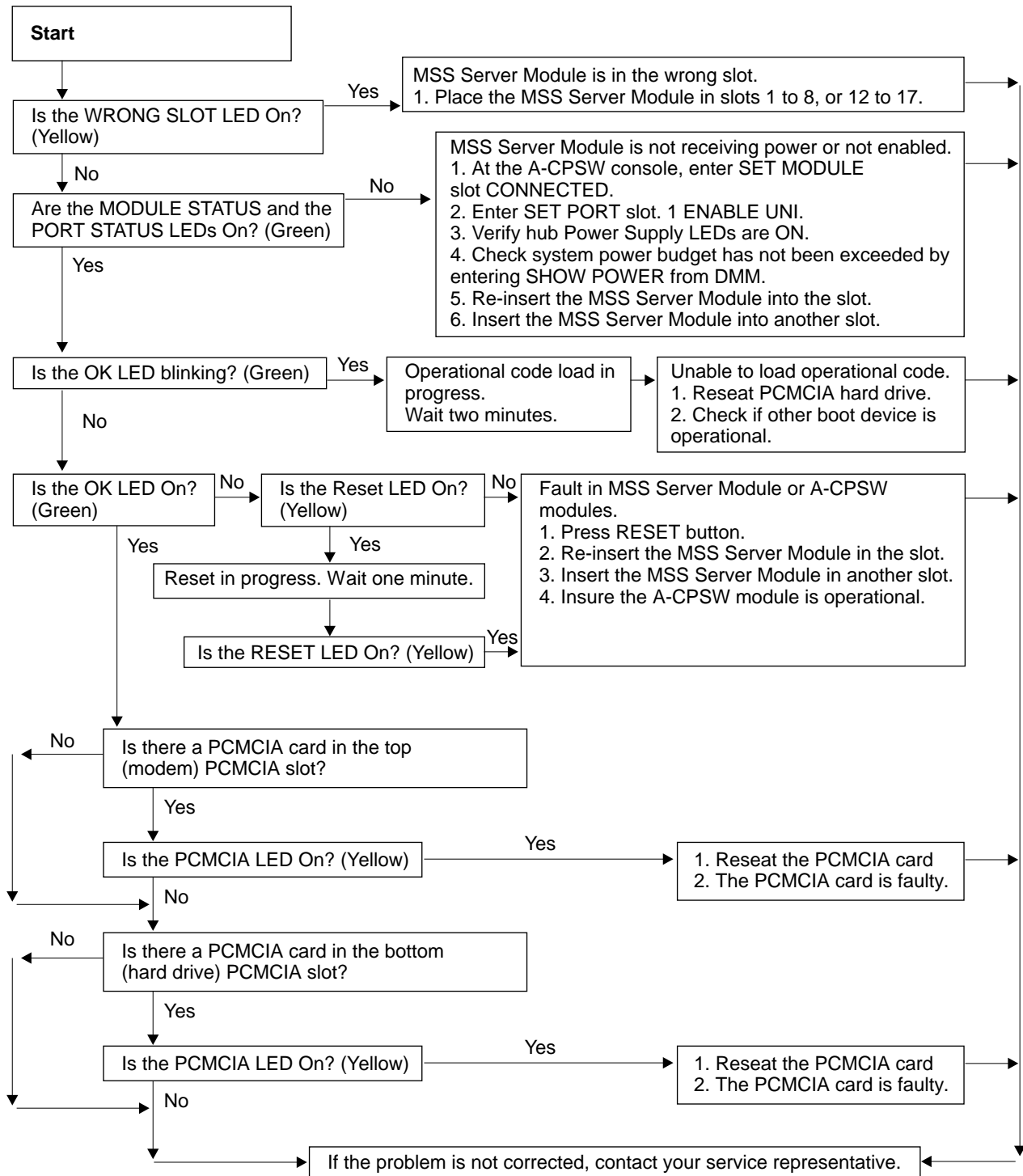


Figure G-2. Problem Solving for the MSS Server Module

Glossary

A

ac. Alternating current.

ACCESS. In network management, the ACCESS clause in a MIB module defines the minimum level of support that a managed node provides for an object.

access method. (1) A technique to obtain the use of data, storage, or the use of an input/output channel to transfer data; for example, random access method, sequential access method. (T) (2) The technique that is used to locate data stored on a physical medium. (A) (3) A technique for moving data between main storage and input/output devices. (4) The way that a system refers to records in files; the reference can be consecutive (records are referred to one after another in the order in which they appear in the file) or it can be random (the individual records are referred to in any order).

active. (1) Able to communicate on the network. (2) Operational. (3) Pertaining to a node or device that is connected or is available for connection to another node or device. (4) Currently transmitting or receiving.

adapter. In a communicating device, a circuit card that, with its associated software and/or microcode, enables the device to communicate over the network.

address. (1) A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A) (2) To refer to a device or an item of data by its address. (I) (A) (3) In word processing, the location, identified by an address code, of a specific section of the recording medium or storage. (T) (4) A name, label, or number identifying a location in storage, a device in a system or network, or any other data source. (5) In data communication, the unique code assigned to each device or workstation connected to a network.

addressing. (1) The assignment of addresses to the instructions of a program. (2) A means of identifying storage locations. (3) In data communication, the way in which a station selects the station to which it is to send data. (4) Specifying an address or location within a file.

Address Resolution Protocol (ARP). A protocol that dynamically maps between Internet addresses, baseband adapter addresses, X.25 addresses, and token-ring adapter addresses on a local area network.

agent. (1) In the client-server model, the part of the system that performs information preparation and

exchange on behalf of a client or server application. See also *client-server model* and *network management station (NMS)*. (2) A customer-service person whose job is to handle outgoing or incoming telephone calls (for example, an agent in an ACD group).

AIX. Advanced Interactive Executive. See *AIX operating system*.

AIX operating system. IBM's implementation of the UNIX operating system. The RISC System/6000 system, among others, runs the AIX operating system. See *UNIX operating system*.

alert. (1) A message sent to a management services focal point in a network to identify a problem or an impending problem. (2) In the NetView and NETCENTER programs, a high priority event that warrants immediate attention.

ambient noise. In acoustics, the noise associated with a particular environment, usually a composite of sounds from many distant or nearby sources. See also *background noise* and *impulsive noise*.

American National Standard Code for Information Interchange (ASCII). The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphics characters. (A)

Note: IBM has defined an extension to ASCII code (characters 12–255).

American National Standards Institute (ANSI). An organization consisting of producers, consumers, and general interest groups, that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

analog. Pertaining to data consisting of continuously variable physical quantities. (A) Contrast with *digital*.

ANSI. American National Standards Institute.

area. As allowed by the Open Shortest Path First (OSPF) protocol, a subset of a network or gateway grouped together by definition of the network administrator. Each area is self-contained; knowledge of an area's topology remains hidden from other areas.

ARP. Address Resolution Protocol.

ARP. Address Resolution Protocol, IP ARP translates network addresses into hardware addresses LE ARP translates LAN Destinations into ATM addresses.

AS. Autonomous system.

ASCII. American Standard Code for Information Interchange.

ATM. Asynchronous Transfer Mode, a connection-oriented, high-speed networking technology based on cell switching.

attach. To make a device a part of a network logically.

Note:

Not to be confused with *connect*, which implies physically connecting a device to a network.

attaching device. Any device that is physically connected to a network and can communicate over the network. See *ring attaching device*.

attachment. A port or a pair of ports, optionally including an associated optical bypass, that are managed as a functional unit. A dual attachment includes two ports: a port A, and a port B. A single attachment includes a Port S.

attention (ATTN). An occurrence external to an operation that could cause an interruption of the operation.

available memory. In a personal computer, the number of bytes of memory that can be used after memory requirements for the operating system, device drivers, and other application programs have been satisfied.

B

background noise. In acoustics, total of all interference sources in a system used to produce, detect, measure, or record a signal, excluding noise produced by the signal itself. See also *ambient noise*, *burst noise*, *impulsive noise*.

base unit. A term used to denote an individual &foxfire., as opposed to an &foxfire. system that can consist of several base units.

Basic Input/Output System (BIOS). Code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard.

batch. (1) An accumulation of data to be processed. (2) A group of records or data processing jobs brought together for processing or transmission. (3) Pertaining to activity involving little or no user action. Contrast with *interactive*.

baud. (1) A unit of signaling speed equal to the number of discrete conditions or signal events per second; for example, one baud equals one-half dot cycle per second in Morse code, one bit per second in a train of binary signals, and one 3-bit value per second in a train of signals each of which can assume one of eight different states. (A) (2) In asynchronous transmission, the unit of modulation rate corresponding to one unit interval per second; that is, if the duration of the unit interval is 20 milliseconds, the modulation rate is 50 baud. (A)

binary. (1) Pertaining to a system of numbers to the base two; the binary digits are 0 and 1. (A) (2) Pertaining to a selection, choice, or condition that has two possible different values or states. (I) (A)

BIOS. Basic Input/Output System.

bits per second (bps). The rate at which bits are transmitted per second. Contrast with *baud*.

bps. Bits per second.

bridge. (1) An attaching device that connects two LAN segments to allow the transfer of information from one LAN segment to the other. A bridge can connect the LAN segments directly by network adapters and software in a single device, or it can connect network adapters in two separate devices through software and use of a telecommunications link between the two adapters. (2) A functional unit that connects two LANs that use the same logical link control (LLC) procedures but may use the same or different medium access control (MAC) procedures. (T) Contrast with *gateway* and *router*.

Note: A bridge connects networks or systems of the same or similar architectures, whereas a gateway connects networks or systems of different architectures.

bridging. The forwarding of a frame from one local area network segment to another. The destination is based upon the medium access control (MAC) sublayer address encoded in the destination address field of the frame header.

broadband local area network (LAN). A local area network (LAN) in which information is encoded, multiplexed, and transmitted through modulation of carriers. (T)

broadcast. (1) Transmission of the same data to all destinations. (T) (2) Simultaneous transmission of the same data to more than one destination. (3) A packet delivery system where a copy of a given packet is given to all hosts attached to the network. Broadcast can be implemented in hardware (Ethernet, for example) or software. Contrast with *multicast*.

C

C. Celsius.

cable loss (optical). The loss in an optical cable equals the attenuation coefficient for the cabled fiber times the cable length.

cache. (1) A special-purpose buffer storage, smaller and faster than main storage, used to hold a copy of instructions and data obtained from main storage and likely to be needed next by the processor. (T) (2) To place, hide, or store in a cache. (3) An optional part of the directory database in network nodes where frequently used directory information can be stored to speed directory searches.

call. A physical or logical association between two or more parties. A held telephone call has two or more parties logically connected, although they are physically disconnected.

call profile characteristics. The attributes of a call profile that determine the functions and capabilities of telephone calls established or manipulated using that profile.

card. In the 3174, a unit of electronic circuitry contained in a plastic casing (or cassette) and providing the controller with a specialized function, for example, a Terminal Adapter or an Encrypt/Decrypt Adapter.

change management. The process of planning, administering, and distributing changes to network hardware and software components. This network management discipline is commonly accepted as a component of configuration management. See *configuration management*.

channel-attached. (1) Pertaining to the connection of devices directly by data channels (I/O channels) to a computer. (2) Pertaining to devices connected to a controlling unit by cables rather than by telecommunication lines. See also *local*. Contrast with *telecommunication-attached*.

characteristics. See *call profile characteristics*.

circuit. (1) A logic device. (2) One or more conductors through which an electric current can flow.

client. (1) A user. (2) A functional unit that receives shared services from a server. (T)

client-server model. A common way to describe network services and the model user processes (programs) of those services.

command. (1) A request for performance of an operation or execution of a program. (2) A character string

from a source external to a system that represents a request for system action.

community. An administrative relationship between Simple Network Management Protocol (SNMP) entities.

configuration. (1) The manner in which the hardware and software of an information processing system are organized and interconnected. (T) (2) The devices and programs that make up a system, subsystem, or network. (3) The task of defining the hardware and software characteristics of a system or subsystem. (4) See also *system configuration*.

configuration file. A file that specifies the characteristics of a system device or network related to a specific product.

configuration management. The monitoring and control of information required to identify physical and logical network resources, their states, and their interdependencies. Services include customization, network resource inventory, and assistance to other network management disciplines.

configuration parameters. Variables in a configuration definition, the values of which characterize the relationship of a product, such as a bridge, to other products in the same network.

connect. In a LAN, to physically join a cable from a station to an access unit or network connection point. Contrast with *attach*.

connection. (1) In data communication, an association established between functional units for conveying information. (I) (A) (2) In Open Systems Interconnection architecture, an association established by a given layer between two or more entities of the next higher layer for the purpose of data transfer. (T) (3) In SNA, the network path that links two logical units (LUs) in different nodes to enable them to establish communications. (4) In X.25 communication, a virtual circuit between two data terminal equipments (DTEs). A switched virtual circuit (SVC) connection lasts for the duration of a call; a permanent virtual circuit (PVC) is a permanent connection between the DTEs. (5) In TCP/IP, the path between two protocol applications that provides reliable data stream delivery service. In Internet, a connection extends from a TCP application on one system to a TCP application on another system. (6) The path between two protocol functions, usually located in different machines, that provides reliable data delivery service. (7) A logical association between a call participant (party) and a switch. A party's connection represents that party's participation in a telephone call.

connector. A means of establishing electrical flow.

controller. A unit that controls input/output operations for one or more devices.

control unit terminal (CUT). A terminal that relies on the 3174 to interpret the data stream. Examples are the 3178, 3179, 3278 Model 2, and 3279 Model S2A.

control unit terminal (CUT) mode. A host-interactive mode that enables an IBM 3270 Personal Computer customized in this mode to run only one session emulating a 3178, 3179, 3278 Model 2, or 3279 Model S2A.

conversion. (1) In programming languages, the transformation between values that represent the same data item but belong to different data types. Information may be lost as a result of conversion since accuracy of data representation varies among different data types. (I) (2) The process of changing from one method of data processing to another or from one data processing system to another. (3) The process of changing from one form of representation to another, for example, to change from decimal representation to binary representation.

cursor. (1) A movable, visible mark used to indicate the position at which the next operation will occur on a display surface. (2) A unique symbol that identifies a character position in a screen display, usually the character position at which the next character to be entered from the keyboard will be displayed.

customer-replaceable unit (CRU). An assembly or part that a customer can replace in its entirety when any of its components fail. Contrast with *field replaceable unit (FRU)*.

customize. The process of defining and activating a configuration and changing system parameters to meet user requirements.

cut-off wavelength. In an optical fiber, the wavelength above which light propagates only in a single mode. (Note: The cut-off wavelength of cabled optical fiber, λ_{cc} , is typically lower than the cut-off wavelength of uncabled optical fiber.)

D

data. (1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by human or automatic means. (I) (A) (2) Any representations such as characters or analog quantities to which meaning is or might be assigned. (A)

database. A collection of data with a given structure for accepting, storing, and providing, on demand, data for multiple users. (T)

data transfer. (1) The result of the transmission of data signals from any data source to a data receiver. (2) The movement, or copying, of data from one location and the storage of the data at another location.

dB. Decibel.

dc. Direct current.

debug. To detect, diagnose, and eliminate errors in programs. (T)

decibel (dB). (1) One tenth of a bel. (2) A unit that expresses the ratio of two power levels on a logarithmic scale. (3) A unit for measuring relative power. The number of decibels is 10 times the logarithm (base 10) of the ratio of the measured power levels; if the measured levels are voltages (across the same or equal resistance), the number of decibels is 20 times the log of the ratio. See also *neper*.

default. Pertaining to an attribute, value, or option that is assumed when none is explicitly specified. (I)

destination. Any point or location, such as a node, station, or particular terminal, to which information is to be sent.

device. (1) A mechanical, electrical, or electronic contrivance with a specific purpose. (2) An input/output unit such as a terminal, display, printer, or telephone. See also *attaching device*. (3) A physical entity attached to the network that requires data transportation service.

device identifier (ID). An 8-bit identifier that uniquely identifies a physical I/O device.

diagnostics. The process of investigating the cause or the nature of a condition or problem in a product or system.

digital. (1) Pertaining to data in the form of digits. (A) Contrast with *analog*. (2) Pertaining to data consisting of numerical values or discrete units.

direct access storage device (DASD). A device in which access time is effectively independent of the location of the data.

disable. To make nonfunctional.

disabled. (1) Pertaining to a state of a processing unit that prevents the occurrence of certain types of interruptions. (2) Pertaining to the state in which a transmission control unit or audio response unit cannot accept incoming calls on a line. (3) Nonoperational or nonfunctional.

disk. A round, flat, data medium that is rotated in order to read or write data. (T) See also *diskette*.

diskette. (1) A small magnetic disk enclosed in a jacket. (T) (2) A thin, flexible magnetic disk and a semi-rigid protective jacket, in which the disk is permanently enclosed.

DOS. Disk Operating System.

dump. (1) To record, at a particular instant, the contents of all or part of one storage device in another storage device. Dumping is usually for the purpose of debugging. (T) (2) Data that has been dumped. (T) (3) To copy data in a readable format from main or auxiliary storage onto an external medium such as tape, diskette, or printer. (4) To copy the contents of all or part of virtual storage for the purpose of collecting error information.

E

EIA 232. In data communications, a specification of the Electronic Industries Association (EIA) that defines the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE), using serial binary data interchange.

electromagnetic interference. A disturbance in the transmission of data on a network resulting from the magnetism created by a current of electricity.

Electronic Industries Association (EIA). An organization of electronics manufacturers that advances the technological growth of the industry, represents the views of its members, and develops industry standards.

Electronic Industries Association (EIA) unit. A unit of measure equal to 4.45 cm (1.75 in.).

electrostatic discharge (ESD). An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

emulation. (1) The use of a data processing system to imitate another data processing system, so that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated system. Emulation is usually achieved by means of hardware or firmware. (T) (2) The use of programming techniques and special machine features to permit a computing system to execute programs written for another system.

enable. To make functional.

enabled. (1) On a LAN, pertaining to an adapter or device that is active, operational, and able to receive frames from the network. (2) Pertaining to the state in which a transmission control unit or an audio response unit can accept incoming calls on a line.

encapsulation. A technique used by layered protocols by which a layer adds header information to the protocol data unit (PDU) from the layer above. In Internet terminology for example, a packet would contain a header from the physical layer, followed by a header from the transport layer (TCP), followed by the application protocol data.

ER. (1) Explicit route. (2) Exception response.

erase. To remove data from a data medium. Erasing is usually accomplished by overwriting the data or deleting the references. (T)

error. A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition. (I) (A) Contrast with *failure* and *fault*.

error log. A data set or file in a product or system where error information is stored for later access.

ESD. Electrostatic discharge.

Ethernet. (1) A 10-Mbps baseband local area network that allows multiple stations to access the transmission medium at will without prior coordination, avoids contention by using carrier sense and deference, and resolves contention by collision detection and transmission. Ethernet uses carrier sense multiple access with collision detection (CSMA/CD). (2) A passive coaxial cable whose interconnections contain devices or components, or both, that are all active. It uses CSMA/CD technology to provide a best-effort delivery system.

event. (1) An occurrence or happening. (2) An occurrence of significance to a task; for example the completion of an asynchronous operation, such as an input/output operation.

exception response (ER). In SNA, a protocol requested in the form-of-response-requested field of a request header (RH) that directs the receiver to return a response only if the request is unacceptable as received or cannot be processed; that is, a negative response, but not a positive response, is to be returned. An exception response is sent only if a request is unacceptable as received or cannot be processed.

execute. To perform the actions specified by a program or a portion of a program. (T)

exit. To execute an instruction within a portion of a computer program in order to terminate the execution of that portion. Such portions of computer programs include loops, subroutines, modules, and so on. (T)

explicit route (ER). In SNA, a series of one or more transmission groups that connect two subarea nodes. An explicit route is identified by an origin subarea

address, a destination subarea address, an explicit route number, and a reverse explicit route number. Contrast with *virtual route (VR)*.

explorer packet. A packet, generated by the source host that traverses the entire token-ring network gathering information on the possible paths the host might use.

F

F. Fahrenheit.

faceplate. A wall-mounted or surface-mounted plate for connecting data and voice connectors to a cabling system.

failure. (1) The termination of the ability of a functional unit to perform its required function. (I) (A) (2) An uncorrected hardware error. Failures are either recoverable or not recoverable by the software or the operator. The operator is always notified when failures occur. Contrast with *error*.

fault. An accidental condition that causes a functional unit to fail to perform its required function. (I) (A)

FDDI. Fiber Distributed Data Interface.

feature. (1) A part of an IBM product that can be ordered separately by the customer. (2) See *switch feature*.

fiber. (1) Dielectric material that guides light; waveguide (see *multimode* and *single-mode optical fiber*). See *optical fiber*.

Fiber Distributed Data Interface (FDDI). A high-performance, general-purpose, multi-station network designed for efficient operation with a peak data transfer rate of 100 Mbps. It uses token-ring architecture with optical fiber as the transmission medium over distances of several kilometers.

fiber optics. The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

Note: Telecommunication applications of fiber optics use optical fibers. Either a single discrete fiber or a nonspatially aligned fiber bundle can be used for each information channel. Such fibers are often called optical fibers to differentiate them from fibers used in noncommunication applications.

field. On a data medium or a storage, a specified area used for a particular class of data; for example, a group of character positions used to enter or display wage rates on a screen. (T)

field-replaceable unit (FRU). An assembly that is replaced in its entirety when any one of its components fails. In some cases a FRU can contain other FRUs; for example, a brush and a brush block that can be replaced individually or as a single unit. Contrast with *customer-replaceable unit (CRU)*.

file. A named set of records stored or processed as a unit. (T)

file name. (1) A name assigned or declared for a file. (2) The name used by a program to identify a file.

fixed disk. Synonym for *hard disk*.

forward. A switch feature that temporarily redirects incoming calls. The incoming calls are redirected from the originally dialed phoneset to another destination. The other destination has previously been defined to the switch by the party associated with the phoneset.

frame. (1) In Open Systems Interconnection architecture, a data structure pertaining to a particular area of knowledge and consisting of slots that can accept the values of specific attributes and from which inferences can be drawn by appropriate procedural attachments. Synonymous with *schema*. (T) (2) A data structure that consists of fields, predetermined by a protocol, for the transmission of user data and control data. The composition of a frame, especially the number and types of fields, may vary according to the type of protocol. Synonymous with *transmission frame*. (T) (3) The unit of transmission in some local area networks, including the IBM Token-Ring Network; it includes delimiters, control characters, information, and checking characters. (4) In SDLC, the vehicle for every command, every response, and all information that is transmitted using SDLC procedures. (5) A packet that is transmitted over a serial line or LANs. See also *packet*. (6) In FDDI, a PDU transmitted between co-operating MAC entities on a ring, and consisting of a variable number of octets and control symbols.

frequency. The rate of signal oscillation, expressed in hertz.

FRU. Field-replaceable unit.

function. (1) A specific purpose of an entity, or its characteristic action. (A) (2) In data communications, a machine action such as carriage return or line feed. (A) (3) In NetView DM, a function is the specification of a transmission activity on a resource or group of resources. Functions are grouped into phases. In CSCM, resources are known as data objects.

function key. (1) In computer graphics, a button or switch that may be operated to send a signal to the computer program controlling the display. (T) (2) A

key that performs a specified set of operations when it is pressed.

G

gateway. (1) A functional unit that interconnects two computer networks with different network architectures. A gateway connects networks or systems of different architectures. A bridge interconnects networks or systems with the same or similar architectures. (T) (2) A computer that attaches two or more networks and routes data packets to their destination through those networks. Contrast with *bridge* and *router*. (3) The original Internet term for router or IP router.

group. (1) A set of related records that have the same value for a particular field in all records. (2) A collection of users who can share access authorities for protected resources. (3) A list of names that are known together by a single name.

H

hard disk. (1) A rigid magnetic disk such as the internal disks used in the system units of personal computers and in external hard disk drives. Synonymous with *fixed disk*. (2) A rigid disk used in a hard disk drive.

Note: The term hard disk is also used loosely in the industry for boards and cartridges containing microchips or bubble memory that simulate the operations of a hard disk drive.

hardware. All or part of the physical components of an information processing system, such as computers or peripheral devices. (T) (A)

help. (1) A choice that allows a user to select various kinds of help information. (2) In SAA Basic Common User Access architecture: (a) An action that gives information about the item the cursor is on, an application panel, or the help facility. (b) An action bar choice that has an associated pull-down. Its pull-down contains choices that can be requested to invoke help actions.

help window. A window that contains help information.

hold. A situation in which a call, consisting of two or more parties, is temporarily suspended by one of the parties in the call, that is, by the holding party. The held call and the holding party continue to have a logical, but not physical, association during the suspension of the call.

host. (1) In Internet terminology, an end system. (2) In interpretive execution mode, the real machine as

opposed to the virtual or interpreted machine (the guest).

host system. (1) A data processing system used to prepare programs and operating environments for use on another computer or controller. (2) The data processing system to which a network is connected and with which the system can communicate. (3) The controlling or highest-level system in a data communication configuration; for example, a System/38 is the host system for the workstations connected to it.

I

IBM Disk Operating System (DOS). A disk operating system based on MS-DOS** that operates with all IBM-compatible personal computers.

ICMP. Internet Control Message Protocol.

ICMP. Internet Control Message Protocol, a protocol for communicating control information over IP.

identifier (ID). (1) One or more characters used to identify or name a data element and possibly to indicate certain properties of that data element. (A) (2) A sequence of bits or characters that identifies a program, device, or system to another program, device, or system.

impulsive noise. In acoustics, noise of an impulsive nature whose level is determined with a sound level meter set for the dynamic characteristic "impulse."

inactive. (1) Not operational. (2) Pertaining to a node or device not connected or not available for connection to another node or device. (3) Pertaining to a station that is only repeating frames or tokens, or both.

information (I) frame. A frame in I format used for numbered information transfer.

input/output (I/O). (1) Pertaining to a device whose parts can perform an input process and an output process at the same time. (I) (2) Pertaining to a functional unit or channel involved in an input process, output process, or both, concurrently or not, and to the data involved in such a process.

Note: The phrase input/output may be used in place of input/output data, input/output signals, and input/output process when such a usage is clear in context.

(3) Pertaining to input, output, or both. (A) (4) Pertaining to a device, process, or channel involved in data input, data output, or both.

insert. To make an attaching device an active part of a LAN.

interactive. Pertaining to a program or system that alternately accepts input and then responds. An interactive system is conversational, that is, a continuous dialog exists between user and system. Contrast with *batch*.

interface. (1) A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics, as appropriate. The concept includes the specification of the connection of two devices having different functions. (T)
(2) Hardware, software, or both, that links systems, programs, or devices.

interference. (1) The prevention of clear reception of broadcast signals. (2) The distorted portion of a received signal. (3) In optics, the interaction of two or more beams of coherent or partially coherent light.

International Organization for Standardization (ISO). An organization of national standards bodies from various countries established to promote development of standards to facilitate international exchange of goods and services, and develop cooperation in intellectual, scientific, technological, and economic activity.

internet. A collection of networks interconnected by a set of routers which allow them to function as a single, large virtual network. See also *Internet*.

Internet. The largest internet in the world consisting of large national backbone networks and a myriad of regional and campus networks all over the world. The Internet uses the Internet protocol suite. See also *internet*.

Internet Control Message Protocol (ICMP). The protocol used to handle errors and control messages in the Internet Protocol layer. Reports of problems and incorrect datagram destinations are returned to the original datagram source. ICMP is part of the Internet Protocol.

Internet Packet Exchange (IPX). The routing protocol used to connect Novell's servers or any workstation or router that implements IPX with other workstations. Although similar to TCP/IP, it uses different packet formats and terminology. See also *TCP/IP* and *Xerox Network Services (XNS)*.

Internet Protocol (IP). (1) A protocol that routes data through a network or interconnected networks. IP acts as an interface between the higher logical layers and the physical network. However, this protocol does not provide error recovery, flow control, or guarantee the reliability of the physical network. IP is a connectionless protocol. (2) A protocol used to route data from its source to its destination in an Internet environment.

interrupt. (1) A suspension of a process, such as execution of a computer program caused by an external

event, and performed in such a way that the process can be resumed. (A) (2) To stop a process in such a way that it can be resumed. (3) In data communication, to take an action at a receiving station that causes the sending station to end a transmission. (4) A means of passing processing control from one software or microcode module or routine to another, or of requesting a particular software, microcode, or hardware function.

I/O. Input/output.

IP. Internet Protocol.

IP. Internet Protocol, a widely-used network layer protocol specified by the IETF.

IP address. A 32-bit address assigned to devices or hosts in an IP internet that maps to a physical address. The IP address is composed of a network and host portion.

IPX. Internet Packet Exchange.

IPX. Internet Packet Exchange, a network layer protocol that is frequently used by personal computer systems.

ISO. International Organization for Standardization.

ISO. International Standards Organization, an organization that specifies international communication standards.

K

Kbps. 1000 bits per second.

L

LAN. Local area network.

lb. Pound.

LE. LAN Emulation, an ATM Forum standard supporting communication between token-ring or Ethernet LAN applications over ATM networks.

LES. LAN Emulation Server, a LAN Emulation Service component that resolves LAN Destinations to ATM Addresses.

link-attached. Pertaining to devices that are physically connected by a telecommunication line. Synonymous with *remote*.

LLC. Logical link control.

LLC. Logical Link Control, the top sublayer of the Data Link layer, which is layer 2 of the ISO model.

lobe receptacle. In the IBM Token-Ring Network, an outlet on an access unit for connecting a lobe.

local. Pertaining to a device accessed directly without use of a telecommunication line. Synonym for *channel-attached*. Contrast with *remote*.

local area network (LAN). (1) Physical network technology that transfers data at high speed over short distances. (2) A network in which a set of devices are connected to one another for communication and that can be connected to a larger network. See also *token ring* and *Ethernet*. (3) A computer network located on a user's premises within a limited geographical area. Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary may be subject to some form of regulation. (T) Contrast with *wide area network (WAN)* and *metropolitan area network (MAN)*.

location. (1) Any place in which data can be stored. (A) (2) With reference to a 3174, a place within the 3174 chassis where a particular card or adapter is inserted.

lock. The means by which integrity of data is ensured by preventing more than one user from accessing or changing the same data or object at the same time.

log. (1) To record; for example, to log all messages on the system printer. (2) A record of events that have occurred.

logical link control (LLC). (1) The data link control (DLC) LAN sublayer that provides two types of (DLC) operation. The first type is connectionless service, which allows information to be sent and received without establishing a link. The LLC sublayer does not perform error recovery or flow control for connectionless service. The second type is connection-oriented service, which requires the establishment of a link prior to the exchange of information. Connection-oriented service provides sequenced information transfer, flow control, and error recovery. (2) A sublayer of the OSI link layer that defines formats and protocols for exchanging frames between LLC sublayers attached to a local area network. It has provisions that ensure that error-free, nonduplicated, properly ordered frames are delivered to the appropriate data-link user. See also *bridge* and *medium access control (MAC)*.

logical link control (LLC) protocol. In a local area network, the protocol that governs the exchange of transmission frames between data stations independently of how the transmission medium is shared. (T) The LLC protocol was developed by the IEEE 802 committee and is common to all LAN standards.

logical link control (LLC) protocol data unit. A unit of information exchanged between link stations in dif-

ferent nodes. The LLC protocol data unit contains a destination service access point (DSAP) address, a source service access point (SSAP), a control field, and user data. See *logical link control (LLC)*.

logical link control (LLC) sublayer. One of two sublayers of the ISO Open Systems Interconnection data link layer (which corresponds to the SNA data link control layer), proposed for LANs by the IEEE Project 802 Committee on Local Area Networks and the European Computer Manufacturers Association (ECMA). It includes those functions unique to the particular link control procedures that are associated with the attached node and are independent of the medium; this allows different logical link protocols to coexist on the same network without interfering with each other. The LLC sublayer uses services provided by the medium access control (MAC) sublayer and provides services to the network layer.

loop. A closed unidirectional signal path connecting input/output devices to a system.

M

MAC. Medium access control.

MAC. Medium Access Control, the bottom sublayer of the Data Link layer, which is layer 2 of the ISO model.

MAN. Metropolitan area network.

management services (MS). Services that assist in the management of networks in areas such as problem management, performance and accounting management, configuration management, and change management.

management station. The system responsible for managing all, or a portion of, a network. The management station talks to network management agents that reside in the managed node by means of a network management protocol such as Simple Network Management Protocol (SNMP). Synonymous with *network management station (NMS)*.

mark. A symbol or symbols that indicate the beginning or the end of a field, a word, an item of data or a set of data such as a file, record, or block. (I) (A)

Mb. Megabit.

MB. (1) For processor storage and real and virtual memory, 1048 576 bytes. (2) For disk storage capacity and transmission rates, 1 000 000 bytes.

Mbps. One million bits per second.

media access control (MAC). In FDDI, the portion of the data link layer responsible for scheduling and

routing data transmissions on a shared medium local area network, for example, an FDDI ring.

medium access control (MAC). (1) The sublayer of the data link control layer that supports media-dependent functions and uses the services of the physical layer to provide services to the logical link control sublayer. The MAC sublayer includes the medium-access port. See *logical link control (LLC)*. (2) For local area networks, the method of determining which device has access to the transmission medium at any time.

medium access control (MAC) frame. In the IBM Token-Ring Network: (1) An address resolution request frame that has the unique part of a destination address and an "all rings" address. A sender issues this request to determine the ring where the destination station is located and whether the node is active. (2) Response from an active destination node to the requesting source node, providing the source node with the complete address and ring number of the destination node.

medium access control (MAC) procedure. In a local area network, the part of the protocol that governs access to the transmission medium independently of the physical characteristics of the medium, but takes into account the topological aspects of the network, in order to enable the exchange of data between data stations.

medium access control (MAC) protocol. (1) In a local area network, the protocol that governs access to the transmission medium, taking into account the topological aspects of the network, in order to enable the exchange of data between data stations. (T) See also *logical link control protocol*. (2) The LAN protocol sublayer of data link control (DLC) protocol that includes functions for adapter address recognition, copying of message units from the physical network, and message unit format recognition, error detection, and routing within the processor.

medium access control (MAC) segment. An individual LAN communicating through the medium access control (MAC) layer within this network.

medium access control (MAC) service data unit (MSDU). In a medium access control (MAC) frame, the logical link control protocol data unit (LPDU) and the routing information field (if the destination station is located on a different ring).

medium access control (MAC) sublayer. In a local area network, the part of the data link layer that applies a medium access method. The MAC sublayer supports topology-dependent functions and uses the services of the physical layer to provide services to the logical link control sublayer. (T)

medium access control (MAC) subvector. A group of related fields within a medium access control (MAC) major vector.

medium access control (MAC) vector. The medium access control (MAC) frame information field.

memory. All of the addressable storage space in a processing unit and other internal storages that is used to execute instructions. (T)

message. (1) In electronic mail, information transferred as an entity between correspondents. (I) (2) An assembly of characters and sometimes control codes that is transferred as an entity from an originator to one or more recipients. A message consists of two parts: envelope and content. (T)

metropolitan area network (MAN). A network formed by the interconnection of two or more networks which may operate at higher speeds than those networks, may cross administrative boundaries, and may use multiple access methods. (T) Contrast with *local area network (LAN)* and *wide area network (WAN)*.

microcode. (1) One or more microinstructions. (2) A code, representing the instructions of an instruction set, that is implemented in a part of storage that is not program-addressable. (3) To design, write, and also test one or more microinstructions.

Note: The term microcode represents microinstructions used in a product as an alternative to hard-wired circuitry to implement functions of a processor or other system component. The term microprogram means a dynamic arrangement of one or more groups of microinstruction for execution to perform a certain function.

mm. Millimeter, millimeters.

modem (modulator/demodulator). (1) A functional unit that modulates and demodulates signals. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities. (T) (A) (2) A device that converts digital data from a computer to an analog signal that can be transmitted in a telecommunication line, and converts the analog signal received to data for the computer.

monitor. (1) A device that observes and records selected activities within a data processing system for analysis. Possible uses are to indicate significant departure from the norm, or to determine levels of utilization of particular functional units. (T) (2) Software or hardware that observes, supervises, controls, or verifies operations of a system. (A) (3) In a token-ring network, the function required to initiate the transmission of a token on the ring and to provide soft-error recovery in case of lost tokens, circulating frames, or

other difficulties. The capability is present in all ring stations.

MSS. Multiprotocol Switched Services, a component of IBM's Switched Virtual Networking (SVN) framework.

multicast. (1) Transmission of the same data to a selected group of destinations. (T) (2) A special form of broadcast where copies of the packet are delivered to only a subset of all possible destinations. Contrast with *broadcast*.

multidrop (network). A network configuration in which there are one or more intermediate nodes on the path between a central node and an endpoint node. (T)

multimode optical fiber. (1) A graded-index or step-index optical fiber that allows more than one bound mode to propagate. (E) Contrast with *single-mode optical fiber*. (2) In FDDI, an optical fiber waveguide usually characterized by a core diameter of 50 to 100 μm that will allow a large number of modes to propagate.

N

name. An alphanumeric term that identifies a data set, statement, program, or cataloged procedure.

name server. A station on an internet that translates host names to their respective internet addresses when requested by the stations on the network.

neper. A unit for measuring power. The number of nepers is the logarithm (base e) of the ratio of the measured power level.

NetBIOS. Network Basic Input/Output System. An operating system interface for application programs used on IBM personal computers that are attached to the IBM Token-Ring Network. See also *BIOS*.

network. (1) An arrangement of nodes and connecting branches. (T) (2) A configuration of data processing devices and software connected for information interchange. (3) A signal path connecting input/output devices to a system. A network can consist of multiple LAN segments connected together with bridging products. See ring (network). (4) The interconnection of two or more subnets. See also *Fiber Distributed Data Interface (FDDI) LAN*.

network administrator. A person who manages the use and maintenance of a network.

network identifier (ID). A 1- to 8-byte customer-selected name or an 8-byte IBM-registered name that uniquely identifies a specific subnetwork.

network management. The process of planning, organizing, and controlling a communications-oriented system.

network management station (NMS). The system responsible for managing a network or a portion of a network. The NMS talks to network management agents, that reside in the managed nodes, by means of a network management protocol. See also *agent*.

newton (N). The force that when applied to a body having a mass of one kilogram gives it an acceleration of one meter per second per second (1 m/s^2).

NMS. Network management station.

noise. (1) A disturbance that affects a signal and that can distort the information carried by the signal. (T) (2) Random variations of one or more characteristics of any entity, such as voltage, current, or data. (A) (3) Loosely, any disturbance tending to interfere with normal operation of a device or system. (A) (4) A random signal of known statistical properties of amplitude, distribution, and spectral density. (A) (5) In acoustics, any undesired sound. See *ambient noise*, *background noise*, *burst noise*, *impulsive noise*, *reference noise*.

O

office. See *work area*.

offline. (1) Pertaining to the operation of a functional unit that takes place either independently of, or in parallel with, the main operation of a computer. (T) (2) Neither controlled by, nor communicating with, a computer. Contrast with *online*.

online. (1) Pertaining to the operation of a functional unit when under the direct control of the computer. (T) (2) Pertaining to a user's ability to interact with a computer. (A) (3) Pertaining to a user's access to a computer via a terminal. (A) (4) Controlled by, or communicating with, a computer. Contrast with *offline*.

open. (1) To make an adapter ready for use. (2) A break in an electrical circuit. (3) To prepare a file for processing.

Open Shortest Path First (OSPF). Provides intra-domain information transfer for the Internet Protocol (IP). An alternative to the Routing Information Protocol (RIP), OSPF allows the lowest cost routing defined by the user and handles routing in large regional or corporate networks.

operating system (OS). Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating

systems are predominantly software, partial hardware implementations are possible. (T)

operation. (1) A defined action, namely, the act of obtaining a result from one or more operands in accordance with a rule that completely specifies the result for any permissible combination of operands. (A) (2) A program step undertaken or executed by a computer; for example, addition, multiplication, extraction, comparison, shift, transfer. The operation is usually specified by the operator part of an instruction. (A) (3) An action performed on one or more data items, such as adding, multiplying, comparing, or moving.

optical cable. A fiber, multiple fibers, or a fiber bundle in a structure built to meet optical, mechanical, and environmental specifications. (E)

optical fiber. Any filament made of dielectric materials that guides light, regardless of its ability to send signals. (E) See also *fiber optics*.

optical fiber cable. Synonym for *optical cable*.

option. (1) A specification in a statement that can be used to influence the execution of the statement. (2) A hardware or software function that can be selected or enabled as part of a configuration process. (3) A piece of hardware (such as a network adapter) that can be installed in a device to modify or enhance device function.

OS. Operating system.

OSPF. Open Shortest Path First, a link-state routing protocol specified by the IETF, link-state routing protocols scale better than vector-distance routing protocols like RIP.

P

packet. (1) In data communication, a sequence of binary digits, including data and control signals, that is transmitted and switched as a composite whole. (I) (2) Synonymous with *data frame*. Contrast with *frame*.

packet internet groper (PING). A program used in TCP/IP networks to test the ability to reach destinations by sending the destinations an Internet Control Message Protocol (ICMP) echo request and waiting for a reply. The term, ping, is used as a verb.

page. (1) The information displayed at the same time on the screen of a display device. (2) In a virtual storage system, a fixed-length block that has a virtual address and is transferred as a unit between real storage and auxiliary storage. (I) (A) (3) To replace the information displayed on the screen with prior or subse-

quent information from the same file. (4) To move back and forth among the pages of a multiple-page panel. See also *scroll*.

panel. A formatted display of information that appears on a display screen.

parallel. (1) Pertaining to a process in which all events occur within the same interval of time, each handled by a separate but similar functional unit; for example, the parallel transmission of the bits of a computer word along the lines of an internal bus. (T) (2) Pertaining to concurrent or simultaneous operation of two or more devices or to concurrent performance of two or more activities in a single device. (A) (3) Pertaining to concurrent or simultaneous occurrence of two or more related activities in multiple devices or channels. (4) Pertaining to the simultaneity of two or more processes. (5) Pertaining to the simultaneous processing of the individual parts of a whole, such as the bits of a character and the characters of a word, using separate facilities for the various parts. (A) (6) Contrast with *serial*.

parallel port. A port that transmits the bits of a byte in parallel along the lines of the bus, 1 byte at a time, to an I/O device. On a personal computer, it is used to connect a device that uses a parallel interface, such as a dot matrix printer, to the computer. Contrast with *serial port*.

parity. (1) A transmission error-checking scheme in which an extra bit is added to some unit of data, usually a byte, in order to make the total number of one bits even or odd. For the AEA feature, odd, even, mark, space, or no-parity coding is supported. No-parity means that no parity bit is sent or expected. Mark and space mean that the parity position is always set to one or zero, respectively, and that received parity is not checked. (2) The state of being either even-numbered or odd-numbered.

parity (even). A condition when the sum of all of the digits in an array of binary digits is even.

parity (odd). A condition when the sum of all of the digits in an array of binary digits is odd.

park. A situation where a party within a telephone call is transferring the call to another, target party, and is placing the call on hold (at the directory number of the target party) without alerting the target party's phone. The party that requests the park function is implicitly disconnected from the telephone call. The remaining party or parties in the telephone call are on hold at the directory number of the target party. See also *hold*.

party. In telephony, an addressable end point of a telephone call.

password. In computer security, a string of characters known to the computer system and a user, who must specify it to gain full or limited access to a system and to the data stored within it.

path. (1) In a network, any route between any two nodes. A path may include more than one branch. (T) (2) The route traversed by the information exchanged between two attaching devices in a network. (3) The series of transport network components (path control and data link control) that are traversed by the information exchanged between two network accessible units (NAUs). A path consists of a virtual route and its route extension, if any. See also *explicit route (ER)*, *route extension (REX)* and *virtual route (VR)*.

path control (PC). The function that routes message units between network accessible units in the network and provides the paths between them. It converts the basic information units (BIUs) from transmission control (possibly segmenting them) into path information units (PIUs) and exchanges basic transmission units containing one or more PIUs with data link control. Path control differs by node type: some nodes (APPN nodes, for example) use locally generated addresses or session identifiers for routing, and others (subarea nodes) use network addresses for routing.

PC. (1) Path control. (2) Personal computer.

PCMCIA. Personal Computer Memory Card International Association, an organization involved in establishing hardware standards that are often associated with miniaturized peripherals.

personal computer (PC). (1) A microcomputer primarily intended for stand-alone use by an individual. (T) (2) A desk-top, floor-standing, or portable microcomputer that usually consists of a system unit, a display monitor, a keyboard, one or more diskette drives, internal fixed-disk storage, and an optional printer. PCs are designed primarily to give independent computing power to a single user and are inexpensively priced for purchase by individuals or small businesses.

physical. (1) Pertaining to actual implementation or location as opposed to conceptual content or meaning. (A) (2) Pertaining to the representation and storage of data on a medium such as magnetic disk, or to a description of data that depends on physical factors such as length of data elements, records, or pointers. (A) (3) Contrast with *logical*. (A) (4) In FDDI, pertaining to the physical layer responsible for delivering a symbol stream produced by an upstream MAC transmitter to the logically adjacent downstream MAC receiver in an FDDI ring.

PING (packet internet groper). A program used in TCP/IP networks to test the ability to reach destinations by sending the destinations an Internet Control Message Protocol (ICMP) echo request and waiting for a reply. The term, ping, is used as a verb.

plug. (1) A connector designed to insert into a receptacle or socket. (2) To insert a connector into a receptacle or socket.

port. (1) An access point for data entry or exit. (2) A connector on a device to which cables for other devices such as display stations and printers are attached. Synonymous with *socket*. (3) The representation of a physical connection to the link hardware. A port is sometimes referred to as an adapter, however, there can be more than one port on an adapter. A single DLC process can control one or more ports. (4) An abstraction used by transport protocols to distinguish among multiple destinations within a host machine. (5) In FDDI, a PHY entity and a PMD entity in a node, together creating a PHY/PMD pair, that can connect to the fiber media and provide one end of a physical connection with another node.

problem determination. The process of determining the source of a problem; for example, a program component, a machine failure, telecommunication facilities, user or contractor-installed programs or equipment, an environment failure such as a power loss, or user error.

procedure. A set of instructions that gives a service representative a step-by-step procedure for tracing a symptom to the cause of failure.

processor. In a computer, a functional unit that interprets and executes instructions. A processor consists of at least an instruction control unit and an arithmetic and logic unit. (T)

protocol. (1) A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I) (2) In Open Systems Interconnection architecture, a set of semantic and syntactic rules that determine the behavior of entities in the same layer in performing communication functions. (T) (3) In SNA, the meanings of, and the sequencing rules for, requests and responses used for managing the network, transferring data, and synchronizing the states of network components.

Q

queue. (1) A list constructed and maintained so that the next data element to be retrieved is the one stored first. (T)

R

rack. A free-standing framework that holds equipment.

radio frequency (RF). (1) The rate of radio signal oscillation, expressed in hertz. (2) Any frequency in the range within which radio waves can be transmitted, from about 10 kHz to about 300 000 MHz.

random access memory (RAM). (1) A storage device in which data can be written and read. (2) A storage device into which data is entered and from which data is retrieved in a nonsequential manner. (3) Deprecated term for *direct access storage device*. (T)

read-only memory (ROM). (1) A storage device in which data, under normal conditions, can only be read. (T) (2) Memory in which stored data cannot be modified by the user except under special conditions.

receptacle. (1) Electrically, a fitting equipped to receive a plug and used to complete a data connection or electrical path. See also *lobe receptacle*. (2) In FDDI, an optoelectronic circuit that converts an optical signal to an electrical logic signal.

reconfiguration. (1) A change made to a given configuration of a computer system; for example, isolating and bypassing a defective functional unit, connecting two functional units by an alternative path. Reconfiguration is effected automatically or manually and can be used to maintain system integrity. (T) (2) The process of placing a processor unit, main storage, and channels offline for maintenance, and adding or removing components.

reference noise. The magnitude of circuit noise that will produce a circuit noise meter reading equal to that produced by ten micromicrowatts of electric power at 1000 cycles per second.

remote. Pertaining to a system, program, or device that is accessed through a telecommunication line. Contrast with *local*. Synonym for *link-attached*.

remove. (1) To take an attaching device off a network. (2) To stop an adapter from participating in data passing on a network.

repeat. (1) The action of a station in receiving a token or frame from the adjacent upstream station and simultaneously sending it to the adjacent downstream station. The FDDI MAC can repeat received PDUs (tokens and frames), but does not repeat the received symbol stream between PDUs. While repeating a frame, MAC can copy the data contents and modify the control indicators as appropriate. (2) The act of a station in receiving a code-bit stream (for example, a frame or token) from an upstream station and placing it on the

medium to the next station. The station repeating the code-bit stream examines it and can copy it into a buffer and modify control indicators as appropriate.

request. The formatted information that the &cpws. sends to a switch as a result of a program issuing a CallPath Services program call.

Request for Comments (RFC). Documents that describe the Internet suite of protocols and related experiments. All Internet standards are written as RFCs.

reset. On a virtual circuit, re-initialization of data flow control. At reset, all data in transit are eliminated.

resident. Pertaining to computer programs or data as long as they remain in computer memory on a particular storage device. (T)

REX. Route extension.

RFC. Request for Comments.

ring. (1) In FDDI, two or more stations wherein information is passed sequentially between active stations, each station in turn examining or copying the information, finally returning it to the originating station. (2) In FDDI, two or more stations connected by a physical medium wherein information is passed sequentially between active stations, each station in turn examining or copying and repeating the information, finally returning it to the originating station. (3) In FDDI, a set of stations wherein information is passed sequentially between stations, each station in turn examining or copying the information, finally returning it to the originating station. In FDDI usage, the term *ring* in *FDDI ring* refers to a dual (counter-rotating) ring. (4) Two or more stations in which information is passed sequentially between active stations, each station in turn examining or copying the information, finally returning it to the originating station. (5) See also *ring network*.

ring attaching device. In a ring network, any device equipped with an adapter that is physically attached to the ring.

ring network. (1) A network configuration in which devices are connected by unidirectional transmission links to form a closed path. (2) A network in which every node has exactly two branches connected to it and in which there are exactly two paths between any two nodes. (T) See also *star/ring network*, *token-ring network*.

RIP. Routing Information Protocol, a vector-distance routing protocol. Versions of RIP are used with IP and IPX.

ROM. Read-only memory. (A)

route. (1) The path that network traffic uses to get from source to destination. (2) An ordered sequence of nodes and transmission groups (TGs) that represent a path from an origin node to a destination node traversed by the traffic exchanged between them.

route extension (REX). In SNA, the path control network components, including a peripheral link that make up the portion of a path between a subarea node and a network addressable unit (NAU) in an adjacent peripheral node. See also *explicit route (ER)*, *path*, and *virtual route (VR)*.

router. (1) A computer that determines that path of network traffic flow. The path selection is made from several paths based on information obtained from specific protocols, algorithms that attempt to identify the shortest or best path, and other criteria such as metrics or protocol-specific destination addresses. (2) An attaching device that connects two LAN segments, which use similar or different architectures, at the reference model network layer. Contrast with *bridge* and *gateway*. (3) In OSI terminology, a router is a network layer intermediate system.

routing. (1) The assignment of the path by which a message is to reach its destination. (2) In SNA, the forwarding of a message unit along a particular path through a network, as determined by parameters carried in the message unit, such as the destination network address in a transmission header.

Routing Information Protocol (RIP). (1) An IP interior gateway protocol that is used to exchange routing information. It is supplied with and used by Berkeley UNIX systems. (2) A protocol that provides intra-domain routing information transfer and calculates a route based upon the least number of hops, regardless of link transmission speed. It is used by several routing protocols including the Internet Protocol (IP), Internet Packet Exchange (IPX), and Xerox Network Services (XNS).

S

SAA. Systems Application Architecture.

schema. Synonym for *frame*. (T)

scroll. To move a display image vertically or horizontally to view data that otherwise cannot be observed within the boundaries of the display screen. See also *page (2)*.

select. The process of choosing a single symbol or menu item by placing the cursor on it and clicking the mouse button. To select multiple symbols simultaneously, press and hold the Shift key down while clicking on the symbols you want to select.

serial. (1) Pertaining to a process in which all events occur one after the other; for example, serial transmission of the bits of a character according to V24 CCITT protocol. (T) (2) Pertaining to the sequential or consecutive occurrence of two or more related activities in a single device or channel. (A) (3) Pertaining to the sequential processing of the individual parts of a whole, such as the bits of a character or the characters of a word, using the same facilities for successive parts. (A) (4) Contrast with *parallel*.

serial port. On personal computers, a port used to attach devices such as display devices, letter-quality printers, modems, plotters, and pointing devices such as light pens and mice; it transmits data 1 bit at a time. Contrast with *parallel port*.

server. (1) A functional unit that provides shared services to workstations over a network; for example, a file server, a print server, a mail server. (T) (2) In a network, a data station that provides facilities to other stations; for example, a file server, a print server, a mail server. (A) (3) A class of adapter in a network node that performs local processing and does not have any physical connections to other devices (as do port adapters and trunk adapters). (4) A device, program, or code module on a network dedicated to providing a specific service to a network.

services. (1) In FDDI, the services provided by one entity to a higher entity or to SMT. (2) In FDDI, a set of functions provided by one OSI layer sublayer entity, for use by a higher layer or sublayer entity or by management entities. (3) In FDDI, the services provided by one entity to another. Data services are provided to a higher layer entity; management services are provided to a management entity in the same or another layer.

session. (1) In network architecture, for the purpose of data communication between functional units, all the activities which take place during the establishment, maintenance, and release of the connection. (T) (2) A logical connection between two network accessible units (NAUs) that can be activated, tailored to provide various protocols, and deactivated, as requested. Each session is uniquely identified in a transmission header (TH) accompanying any transmissions exchanged during the session. (3) The period of time during which a user of a terminal can communicate with an interactive system, usually, elapsed time between logon and logoff.

Simple Network Management Protocol (SNMP).

(1) An IP network management protocol that is used to monitor routers and attached networks. (2) A TCP/IP-based protocol for exchanging network management information and outlining the structure for communications among network devices. SNMP is an application layer protocol. Information on devices

managed is defined and stored in the application's Management Information Base (MIB).

single-mode optical fiber. (1) An optical fiber in which only the lowest-order bound mode (which can consist of a pair of orthogonally polarized fields) can propagate at the wavelength of interest. (E) Contrast with *multimode optical fiber*. (2) In FDDI, single-mode fiber is an optical fiber waveguide usually characterized by a very small Mode Field Diameter (9-10 μm). When operated above its cut-off wavelength, it propagates only a single mode (see *cut-off wavelength*).

SLIP. Serial Line IP, an IETF standard for running IP over serial communication links.

SNMP. Simple Network Management Protocol.

SNMP. Simple Network Management Protocol, an IETF standard protocol using MIBs to control and monitor network elements.

socket. (1) In the AIX operating system: (a) A unique host identifier created by the concatenation of a port identifier with a transmission control protocol/Internet protocol (TCP/IP) address. (b) A port identifier. (c) A 16-bit port number. (d) A port on a specific host; a communications end point that is accessible through a protocol family's addressing mechanism. A socket is identified by a socket address. See also *socket address*. (2) An IP address and port number pairing. (3) In TCP/IP, the Internet address of the host computer on which the application runs, and the port number it uses. A TCP/IP application is identified by its socket. (4) Synonym for *port* (2).

source route bridging. A bridging method that uses the routing information field in the IEEE 802.5 medium access control (MAC) header of a frame to determine which rings or token-ring segments the frame must transit. The RI field is inserted into the MAC header by the originating (source) node. The information in the routing information field is derived from explorer packets generated by the source host. See *explorer packet*.

star/ring network. A ring network with unidirectional transmission, laid out in such a way that several data stations are grouped and interconnected to the network by means of lobe attaching units. This configuration allows attachment and removal of data stations without disrupting network operations. (A)

station. (1) An input or output point of a system that uses telecommunication facilities; for example, one or more systems, computers, terminals, devices, and associated programs at a particular location that can send or receive data over a telecommunication line. (2) A location in a device at which an operation is performed; for example, a read station.

Station Management (FDDI). (1) The supervisory entity within an FDDI station that monitors and controls the various FDDI entities including PMD, MAC, and PHY. (2) The entity within a station on the ring that monitors station activity and exercises overall appropriate control of station activity.

storage. (1) A functional unit into which data can be placed, in which they can be retained and from which they can be retrieved. (T) (2) The action of placing data into a storage device. (I) (A) (3) A storage device. (A)

Note: The terms storage and memory are sometimes used loosely as synonyms. In a more precise and useful sense, the term memory pertains to the part of storage in which instructions are executed (main storage or execution space) and excludes auxiliary storage devices such as disks, diskettes, mass storage devices, and magnetic tape. The term memory is used primarily in microcomputers and calculators, whereas the term main storage is used primarily in large and intermediate systems.

subnet. Shortened form of *subnetwork*. See *subnetwork*.

subnet mask. A bit template that identifies to the TCP/IP protocol code the bits of the host address that are to be used for routing for specific subnets.

subnetwork. Any group of nodes that have a set of common characteristics, such as the same network ID.

subsystem. A secondary or subordinate system, or programming support, usually capable of operating independently of, or asynchronously with, a controlling system. (T)

switch. (1) On an adapter, a mechanism used to select a value for, enable, or disable a configurable option or feature.

switch feature. A service provided by the switch that can be invoked by a program or by manual phoneset activity. "Do not disturb" is an example of a switch feature.

symbol. (1) In FDDI, the smallest signalling element used by MAC, that is, the PHY SDU. The symbol set consists of 16 data symbols and 8 control symbols. Each symbol maps to a specific sequence of five code bits as transmitted by the physical layer. (2) In FDDI, the smallest signalling element used by the Data Link Layer (DDL). The symbol set consists of 16 data symbols and 8 control symbols. Each symbol corresponds to a specific sequence of code bits (code group) to be transmitted by the physical layer.

system. In data processing, a collection of people, machines, and methods organized to accomplish a set of specific functions. (I) (A)

system configuration. A process that specifies the devices and programs that form a particular data processing system.

Systems Application Architecture (SAA). An architecture developed by IBM that consists of a set of selected software interfaces, conventions, and protocols, and that serves as a common framework for application development, portability, and use across different IBM hardware systems.

Systems Application Architecture (SAA) solution. A set of IBM software interfaces, conventions, and protocols that provide a framework for designing and developing applications that are consistent across systems.

T

TCP. Transmission Control Protocol.

TCP/IP. Transmission Control Protocol/Internet Protocol.

telecommunication-attached. Pertaining to the attachment of devices by teleprocessing lines to a host processor. Synonym for *remote*. Contrast with *channel-attached*.

Telnet. In TCP/IP, an application protocol that allows a user at one site to access a remote system as if the user's display station were locally attached. Telnet uses the Transmission Control Protocol as the underlying protocol.

terminal. In data communication, a device, usually equipped with a keyboard and display device, capable of sending and receiving information.

token. (1) In a local area network, the symbol of authority passed successively from one data station to another to indicate the station temporarily in control of the transmission medium. Each data station has an opportunity to acquire and use the token to control the medium. A token is a particular message or bit pattern that signifies permission to transmit. (T) (2) A sequence of bits passed from one device to another along the token ring. When the token has data appended to it, it becomes a frame.

token ring. (1) A network with a ring topology that passes tokens from one attaching device to another; for example, the IBM Token-Ring Network. See also *local area network (LAN)*. (2) A group of interconnected token rings.

token-ring network. (1) A ring network that allows unidirectional data transmission between data stations, by a token passing procedure, such that the transmitted data return to the transmitting station. (T) (2) A network that uses a ring topology, in which tokens are passed in a sequence from node to node. A node that is ready to send can capture the token and insert data for transmission. (3) A group of interconnected token rings.

topology. The physical or logical arrangement of nodes in a computer network. Examples are ring topology and bus topology.

Transmission Control Protocol (TCP). (1) A communications protocol used in Internet and in any network that follows the U.S. Department of Defense standards for inter-network protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It assumes that the Internet protocol is the underlying protocol. (2) A transport protocol in the Internet suite of protocols that provides reliable, connection-oriented, full-duplex data stream service.

Transmission Control Protocol/Internet Protocol (TCP/IP). (1) A set of protocols that allow cooperating computers to share resources across a heterogeneous network. (2) A set of communication protocols that support peer-to-peer connectivity functions for both local and wide area networks.

transmission frame. (1) In data transmission, data transported from one node to another in a particular format that can be recognized by the receiving node. In addition to a data or information field, a frame has some kind of delimiter that marks its beginning and end and usually control fields, address information that identifies the source and destination, and one or more check bits that allow the receiver to detect any errors that occur after the sender has transmitted the frame. (2) In synchronous data link control (SDLC), the vehicle for every command, every response, and all information that is transmitted using SDLC procedures. Each frame begins and ends with a flag. (3) In high level data link control (HDLC), the sequence of contiguous bits bracketed by and including opening and closing flag (01111110) sequences. (4) In a token-ring network, a bit pattern containing data that a station has inserted for transmission after capturing a token.

transparent. (1) Pertaining to operations or data that are of no significance to the user. (2) In data transmission, pertaining to information not recognized by the receiving program or device as transmission control characters.

transparent bridging. A method for tying individual local area networks (LANs) together through the

medium access control (MAC) level. A transparent bridge keeps the tables that hold MAC addresses so that frames seen by the bridge can be forwarded to another LAN if the tables indicate to do so.

U

UDP. User Datagram Protocol.

unattended mode. A mode in which no operator is present or in which no operator station is included at system generation.

UNIX operating system. An operating system developed by Bell Laboratories that features multiprogramming in a multiuser environment. The UNIX operating system was originally developed for use on minicomputers, but has been adapted for mainframes and microcomputers.

Note: The AIX operating system is IBM's implementation of the UNIX operating system.

User Datagram Protocol (UDP). (1) In TCP/IP, a packet-level protocol built directly on the Internet Protocol layer. UDP is used for application-to-application programs between TCP/IP host systems. (2) A transport protocol in the Internet suite of protocols that provides unreliable, connectionless datagram service. (3) The Internet Protocol that enables an application programmer on one machine or process to send a datagram to an application program on another machine or process. UDP uses the internet protocol (IP) to deliver datagrams.

V

V. Volt.

variable. (1) In computer programming, a character or group of characters that refers to a value and, in the execution of a computer program, corresponds to an address. (2) A quantity that can assume any of a given set of values. (A) (3) In SNMP, a match of an object instance name with an associated value.

version. A separately licensed program, based on an existing licensed program, that usually has significant new code or new function.

virtual route (VR). (1) A path between a data source and a data sink that may be created by various circuit configurations during the transmission of packets or messages. (T) (2) In SNA, a logical connection: (a) between two subarea nodes that is physically realized as a particular explicit route, or (b) that is contained wholly within a subarea node for intra-node sessions. A

virtual route between distinct subarea nodes imposes a transmission priority on the underlying explicit route, provides flow control through virtual route pacing, and provides data integrity through sequence numbering of path information units (PIUs). See also *explicit route (ER)*, *path*, *route extension (REX)*.

vital product data (VPD). Product identification information that describes the hardware and software components in the product. VPD is used to assist in asset and inventory control, performing problem determination, identifying service levels, and ensuring proper hardware and software compatibility levels.

VPD. Vital product data.

VR. Virtual route.

W

WAN. Wide area network.

wide area network (WAN). (1) A network that provides communication services to a geographic area larger than that served by a local area network or a metropolitan area network, and that may use or provide public communication facilities. (T) (2) A data communications network designed to serve an area of hundreds or thousands of miles; for example, public and private packet-switching networks and national telephone networks. Contrast with *local area network (LAN)* and *metropolitan area network (MAN)*.

window. (1) In computer graphics, a predetermined part of a virtual space. (2) A division of a screen in which one of several programs being executed concurrently can display information. (3) One or more parts of a display screen with visible boundaries in which information is displayed. (4) See also *help window*.

work area. An area in which devices such as displays, keyboards, and printers are located.

workstation. (1) A functional unit at which a user works. A workstation often has some processing capability. (T) (2) Personal desktop computer consisting of a monitor, keyboard, and central processing unit. Workstations can have voice/data application program software enabled by CallPath for Workstations.

wrap plug. In a fiber optic channel link environment, a type of duplex connector used to wrap the optical output signal of a device directly to the input of the same device.

write. To make a permanent or transient recording of data in a storage device or on a data medium. (I) (A)

X

Xerox Network Services (XNS). A Xerox Network Services protocol. This term collectively describes the suite of internet protocols developed by the Xerox Corporation. Although similar to TCP/IP protocols, XNS uses different packet formats and terminology. See also *IPX*.

XNS. Xerox Network Services.

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Tell Us What You Think!

Multiprotocol Switched Services (MSS) Server Service Manual

Publication No. GY27-0354-01

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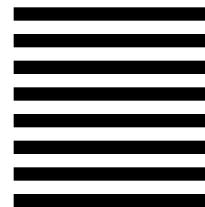
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