

IBM TotalStorage™ Network Attached Storage 300
Model 325



Installation Guide

IBM TotalStorage™ Network Attached Storage 300
Model 325



Installation Guide

NOTE

Before using this information and the product it supports read the safety information in "Appendix I. Safety and environmental notices" on page 105 and the general information in "Appendix H. Notices" on page 103.

First Edition (July 2001)

This guide applies to the IBM TotalStorage Network Attached Storage 300.

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Contents

About this guide	vii
Who should read this guide	vii
Frequently used terms	vii
Publications	vii
Hardcopy publications shipped with the IBM TotalStorage Network Attached Storage 300	vii
Related publications	viii
Web sites	viii
Getting help online	viii
Other helpful sites.	viii
Online support	viii
Chapter 1. Introduction	1
IBM NAS 300 overview	1
IBM NAS 300 engines.	1
Features.	1
Components	2
RAID storage controller	2
Features.	3
Components	3
Storage Unit	6
Features.	6
Components	7
Fibre Channel hub Overview	11
GBICs	12
Serial port connection	12
Ethernet connection	12
Supported software applications	12
Chapter 2. Installation	13
Unpacking	13
Tool requirements and rack contents	13
Removing the packing materials	14
Removing the rack cabinet from the pallet	15
Removing the shipping protection	16
Cabling the IBM NAS 300	17
Cabling the engines	18
Cabling the Fibre Channel hubs	18
Cabling the RAID storage controller	19
Cabling the storage unit	25
Powering the IBM NAS 300 on and off	25
Checkout	27
Chapter 3. Installing and replacing IBM NAS 300 components	29
Safety information.	29
Before you begin	29
Handling static-sensitive devices	29
Working inside a IBM NAS 300 component while power is on.	29
System reliability considerations	29
Installing and replacing IBM NAS 300 engine components	30
Major components	30
Installation and replacement procedures	32
Replacing the entire engine	47

Installing and replacing RAID storage controller components	47
Handling static-sensitive devices	47
Working with hot-swap drives	47
Working with hot-swap cooling fans	50
Working with hot-swap power supplies	51
Working with hot-swap RAID controllers.	55
Replacing the battery in the RAID controller	58
Installing GBICs and fiber optic cables	61
Installing and replacing storage unit components	64
Handling static-sensitive devices	64
Working with hot-swap drives	65
Working with hot-swap power supplies	67
Working with hot-swap ESM boards	69
Working with GBICs	70
Working with hot-swap cooling fans	70
Working with the Fibre Channel hub	72
Appendix A. IBM NAS 300 Engine communication adapters	73
Ethernet adapters	73
IBM 10/100 Ethernet Controller	73
IBM 10/100 Ethernet Server adapter	73
IBM Gigabit Ethernet SX Server adapters	73
Advanced Systems Management	74
Advanced Systems Management adapter	74
IBM PCI Fast/Wide Ultra SCSI Adapter	75
Appendix B. PCI Adapter Placement	77
Appendix C. Power Cable Placement	79
Appendix D. Signal Cable Placement	81
Appendix E. Getting help, service, and information	87
Service support.	87
Before you call for service.	88
Getting customer support and service	88
Getting help online: www.ibm.com/storage/support/nas	88
Getting help by telephone	89
Appendix F. Purchasing additional services	91
Warranty and repair services.	91
Appendix G. Product warranties and notices	93
Warranty Statements.	93
IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)	93
IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 – General Terms)	96
Part 2 - Worldwide Country-Unique Terms	98
Power cords	102
Appendix H. Notices	103
Trademarks.	104
Appendix I. Safety and environmental notices	105
Safety notices.	105

General safety	105
Electrical safety	106
Safety inspection guide	107
Handling electrostatic discharge-sensitive devices	108
Grounding requirements	109
Translated safety notices	109
Environmental notices	140
Electronic emission notices	140
Index	143

About this guide

This guide provides information necessary to install the hardware for the IBM TotalStorage™ Network Attached Storage 300.

Who should read this guide

This guide is intended for anyone responsible for planning, performing or reviewing IBM TotalStorage Network Attached Storage 300 hardware installations.

Frequently used terms

The following list of terms, used within this document, have these specific meanings:

Term	Definition in this document
Drive bay	A receptacle into which you insert a hard disk drive in an appliance. The bays could be physically located in a separate rack from the appliance.
Engine	The processor that responds to requests for data from clients. This is where the operating software for the NAS 300 appliance resides.
Storage unit	Hardware that contains one or more drive bays, power supplies, and a network interface. Some storage units contain a RAID controller. There are no other components in a storage unit, and it is accessed by a NAS appliance.
Notes	These notices provide important tips, guidance, or advice.
Attention	These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
Caution	These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.
Danger	These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.

Publications

The following section lists the publications that are shipped with the product and helpful related publications.

Hardcopy publications shipped with the IBM TotalStorage Network Attached Storage 300

The following publications are shipped in hardcopy and are also provided in softcopy form at www.ibm.com/storage/support/nas:

- *IBM TotalStorage Network Attached Storage 300 Installation Guide, GA27-4275*
This publication provides procedures for setting up, cabling, and replacing components of the IBM TotalStorage Network Attached Storage 300.
- *Release Notes*

This document provides any changes that were not available at the time this book was produced.

Related publications

The following publications contain additional information about the IBM NAS 300:

- *IBM TotalStorage Network Attached Storage 300 User's Reference*, GA27-4276
- *IBM TotalStorage Network Attached Storage 300 Service Guide*, GY27-0402

Web sites

Getting help online

www.ibm.com/storage/nas

Here you can visit a support page that is specific to your hardware, complete with FAQs, parts information, technical hints and tips, technical publications, and downloadable files, if applicable.

Other helpful sites

www.ibm.com	Main IBM home page
www.ibm.com/storage	IBM Storage home page
www.ibm.com/storage/support/nas	IBM NAS Support home page
www.ibm.com/storage/nas	IBM NAS products
www.tivoli.com	Tivoli
www.cdpi.com	Columbia Data Products

Online support

Use the following Web site to obtain online support:

www.storage.ibm.com/support/nas

Chapter 1. Introduction

The IBM TotalStorage Network Attached Storage 300, hereafter referred to as *IBM NAS 300*, is a storage *appliance* that allows you to easily attach storage to a network. Because it is an appliance, you do not need to know about the internal operating system.

IBM NAS 300 overview

The IBM NAS 300 is a rack-mounted storage server consisting of the following components:

Engines

Two IBM 5187 Network Attached Storage Model 5RZ engines. These act as a “gateway” between your Ethernet network and the network-attached storage.

Fibre Channel hubs

Two IBM 3534 Fibre Channel Hub Model 1RUs. These devices connect the engines to the storage controller.

RAID storage controller

An IBM 5191 RAID Storage Controller Model 2RU. This device delivers fast, high-volume data transfer, retrieval, and storage functions across multiple drives, to multiple hosts. Optionally, a second storage controller can be added to the IBM NAS 300 to increase the number of hard drives available.

Storage units

Multiple IBM 5192 Network Attached Storage Storage Unit Model 1RU. Optionally, these 10-drive expansion units can add additional Fibre Channel (FC) disk storage.

IBM NAS 300 engines

The IBM NAS 300 comes standard with two IBM TotalStorage Network Attached Storage Models 5RZ engines.

Features

Each engine includes the following standard features:

- Dual 933 MHz processors
- 1-GB Memory
- 1-port Fibre Channel adapter
- 1 built-in 10Base-T/100Base-TX Ethernet controller
- 9.1-GB Hard Disk Drive
- Dual 270-W Redundant Power Supplies

You can add the following features to each of the IBM NAS 300 engines:

- IBM 10/100 Ethernet Server adapters
- IBM Gigabit Ethernet SX Server adapters
- Netfinity Advanced System Management PCI Adapter
- IBM PCI Fast/Wide Ultra SCSI Adapter

For additional information about these adapters, see “Appendix A. IBM NAS 300 Engine communication adapters” on page 73 and “Appendix B. PCI Adapter Placement” on page 77.

Components

The following sections show the components of the engine.

Note: The hot-swap features of the engine enable you to remove and replace hard disk drives, power supplies, and fans without powering off the engine. Therefore, you can maintain the availability of your system while a hot-swap device is removed or replaced.

The following is a list of components found in each engine:

Microprocessors

Each engine comes with two 933-MHz Pentium III processors.

Memory modules

Each engine contains two 512-MB memory modules.

Non hot-swap drives

Each engine contains a 3.5-inch diskette drive and a compact disk drive.

Hot-swap hard disk drive

Each engine comes with one hot-swap hard disk drive. This drive is used by the engine’s operating system.

Hot-swap fans

Each engine has three interchangeable hot-swap and redundant fans. If one fan fails, the other fans continue to operate. All fans must be installed to maintain proper cooling within your engine, even if one fan is not operational.

Hot-swap power supplies

Each engine comes with two hot-swap power supplies. Both power supplies must be installed to maintain proper cooling.

PCI adapters

Each engine has four available PCI slots. You can add optional Ethernet, ASM, and SCSI adapters. For more information about optional adapters, see “Appendix A. IBM NAS 300 Engine communication adapters” on page 73.

RAID storage controller

The IBM NAS 300 RAID storage controller comes with two RAID controllers, two power supplies, and two cooling units, and provides dual, redundant controllers, redundant cooling, redundant power, and battery backup of the RAID controller cache.

The IBM NAS 300 RAID storage controller supports *Fibre Channel*. It is a new technology, similar to a high-speed network, that you can use to connect large amounts of disk storage to a controller or cluster of controllers. Fibre Channel technology provides increased performance, scalability, availability, and distance for attaching storage subsystems to network servers. The RAID storage controller provides for the attachment of Fibre Channel disk drives to give superior performance and redundancy.

Features

Each RAID storage controller includes the following standard features:

- Dual RAID controllers
- 10 Fibre Channel 40-pin disk drives
- Dual power supplies and dual modular cooling fan assemblies
- Support for RAID levels 0, 1, 3, 5, and 10

Table 1. RAID storage controller features

<p>General</p> <ul style="list-style-type: none"> • Modular components: <ul style="list-style-type: none"> – High-capacity disk drives – RAID controllers – Power supplies – Cooling fans • Technology: <ul style="list-style-type: none"> – Support for disk arrays – Support for clustering – Fibre Channel host interface – Redundant data storage, cooling system, power system, and RAID controllers – Hot-swap technology for drives, power supplies, fans, and RAID controllers 	<ul style="list-style-type: none"> • User interface: <ul style="list-style-type: none"> – Built-in power, activity, and fault light emitting diodes (LEDs) – Identification labeling on customer replaceable units (CRUs), rear LEDs, switches, and connectors – Easy-to-replace drives, power supplies, RAID controllers, and fans <p>Disk drive storage</p> <p>Maximum drives per storage server: 10</p>	<p>RAID controllers</p> <ul style="list-style-type: none"> • Technology and interfaces: <ul style="list-style-type: none"> – Fibre Channel: 40-pin FC disk drives – Fibre Channel interface: Four Gigabit Interface Converter (GBIC) connectors for incoming and outgoing FC cables (two GBICs on each RAID controller)
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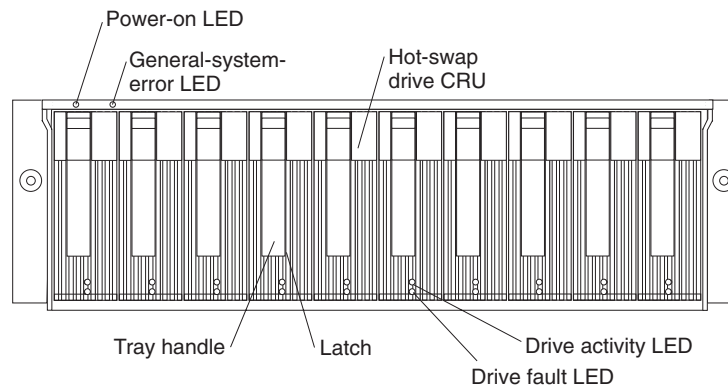
Components

The following sections show the components of the RAID storage controller.

Note: The hot-swap features of the RAID storage controller enable you to remove and replace hard disk drives, power supplies, RAID controllers, and fans without powering off the RAID storage controller. Therefore, you can maintain the availability of your system while a hot-swap device is removed or replaced.

Front view

The following illustration shows the components and controls on the front of the RAID storage controller.



Power-on LED

When on, this green light indicates that the unit has good dc power.

General-system-error LED

When on, this amber LED indicates that the RAID storage controller has a fault, such as in a power supply, fan unit, or hard disk drive.

Note: If the General-system-error LED is on continuously (not flashing), there is a problem with the RAID storage controller. Use the storage-management software to diagnose and repair the problem.

Hot-swap drive CRU

Your RAID storage controller comes standard with 10 hot-swap drive *customer replaceable units* (CRUs) in the storage server. Each drive CRU consists of a hard disk drive and tray.

Drive activity LED

Each drive CRU has a green Drive activity LED. When flashing, this green LED indicates drive activity. When on continuously, this green LED indicates that the drive is properly installed.

Drive fault LED

Each drive CRU has an amber Drive fault LED. When on, this amber LED indicates a drive failure. When flashing, this amber LED indicates that a drive identify or rebuild process is in progress.

Latch This multipurpose blue latch releases or locks the drive CRU in place.

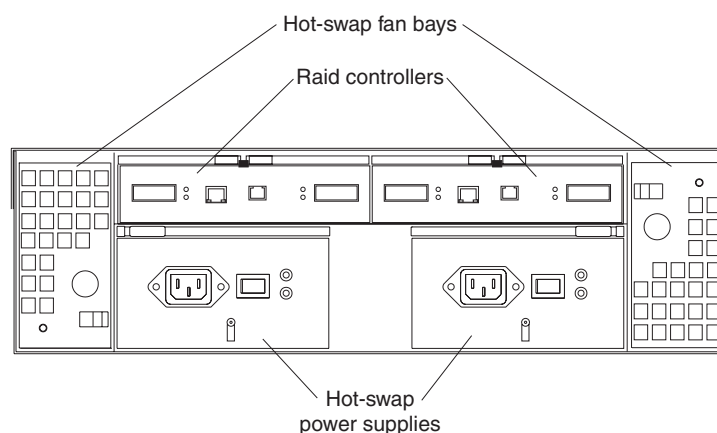
Tray handle

You can use this multipurpose handle to insert and remove a drive CRU in the bay.

For information on installing and replacing drive CRUs, see “Working with hot-swap drives” on page 47. For more information about the LEDs, see the *User’s Reference*.

Back view

The following illustration shows the components at the back of the IBM NAS 300 RAID storage controller.



RAID controller

The RAID storage controller comes with one or two hot-swap RAID controllers. Each RAID controller contains two ports for Gigabit Interface Converters (GBICs), which connect to the Fibre Channel cables. One GBIC connects to a host system. The other GBIC is used to connect additional expansion units to the storage server.

Each RAID controller also contains a battery to maintain cache data in the event of a power failure.

Hot-swap fans

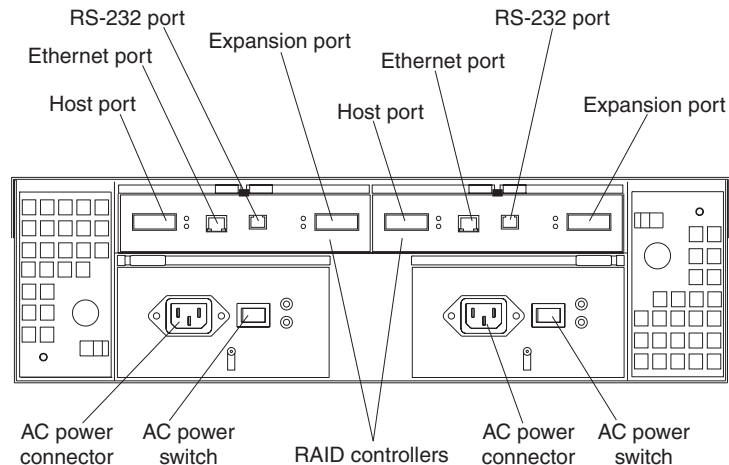
The storage server has two interchangeable hot-swap and redundant fan CRUs. Each fan CRU contains two fans. If one fan CRU fails, the second fan CRU continues to operate. Both fan CRUs must be installed to maintain proper cooling within your storage server, even if one fan CRU is not operational.

Hot-swap power supplies

The storage server comes with two hot-swap power supplies. Both power supplies must be installed to maintain proper cooling.

Interface ports and switches

The following illustration shows the ports and switches on the back of the storage server.



RAID controller

Each RAID controller contains several connectors and LEDs. Each controller has one host port and one expansion port for connecting the storage server to hosts or expansion units. You first insert GBICs into the ports and then connect the Fibre Channel cables.

Host port

The host port is used to connect a Fibre Channel cable from the IBM NAS 300 Fibre Channel hub. You first insert a GBIC into the port and then connect a Fibre Channel cable.

Ethernet port

The Ethernet port is for an RJ-45 10 BASE-T or 100 BASE-T Ethernet connection. Use the Ethernet connection to directly manage storage subsystems.

Expansion port

The expansion port is used to connect additional expansion units to the RAID controllers. You first insert a GBIC into the port and then connect a Fibre Channel cable.

RS-232 port

The RS-232 port is a TJ-6 modular jack and is used for an RS-232 serial

connection. The RS-232 port is used by service personnel to perform diagnostic operations on the RAID controllers. An RS-232 cable comes with the RAID storage controller.

Storage Unit

The IBM NAS 300 storage unit is a compact unit that provides high-capacity, Fibre Channel (FC) disk storage. It delivers fast, high-volume data transfer, retrieval, and storage functions across multiple drives, to multiple hosts. The expansion enclosure is designed for continuous, reliable service; the modular, redundant disk drives, power supplies, ESM boards, and fans use hot-swap technology for easy replacement without shutting down the system.

The expansion unit supports redundant, dual-loop configurations. Optional external FC cables and gigabit interface converters (GBICs) connect the controller to the expansion unit.

By adding an additional RAID storage controller, you can add up to seven 10-drive storage units to your IBM NAS 300.

Features

Each storage unit includes the following standard features:

- Dual ESM boards: The environmental services monitor (ESM) boards contain the expansion unit controls, switches, and LEDs. Each ESM board has two GBIC ports for connecting the storage unit to the RAID storage controller.
- 10 Fibre Channel 40-pin disk drives
- Dual power supplies and dual modular cooling fan assemblies

Table 2. storage unit features

General	Disk drive storage	ESM boards
<ul style="list-style-type: none"> • Modular components: <ul style="list-style-type: none"> – High-capacity disk drives – Environmental services monitor (ESM) boards – Power supplies – Cooling fans • Technology: <ul style="list-style-type: none"> – Supports disk arrays – Supports clustering – Fibre Channel host interface – Redundant data storage, cooling system, power system, and ESM boards – Hot-swap technology for drives, power supplies, fans, and ESM boards • User interface: <ul style="list-style-type: none"> – Built-in power, activity, and fault indicators – Identification labeling CRUs, rear indicator lights, switches, and connectors – Easy-to-replace drives, power supplies, ESM boards, and fans 	Maximum drives per storage unit: 10	<ul style="list-style-type: none"> • Technology and interfaces: <ul style="list-style-type: none"> – Fibre Channel: 40-pin FC disk drives – Fibre Channel interface: Four, GBICs connectors for incoming and outgoing FC cables (two GBICs on each ESM board)

Components

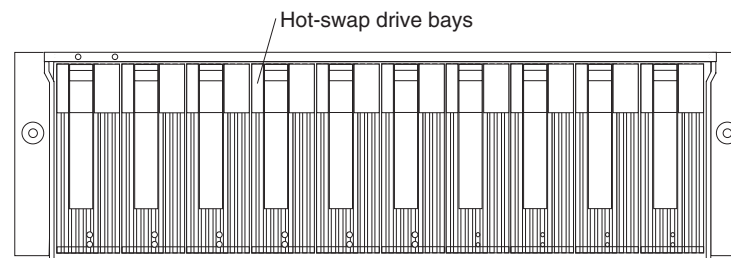
The following sections describe the components of the storage unit.

Note: The hot-swap features of the IBM NAS 300 storage unit enable you to remove and replace hard disk drives, power supplies, ESM boards, and fans without turning off the storage unit. Therefore, you can maintain the availability of your system while a hot-swap device is removed or replaced.

Storage unit CRUs

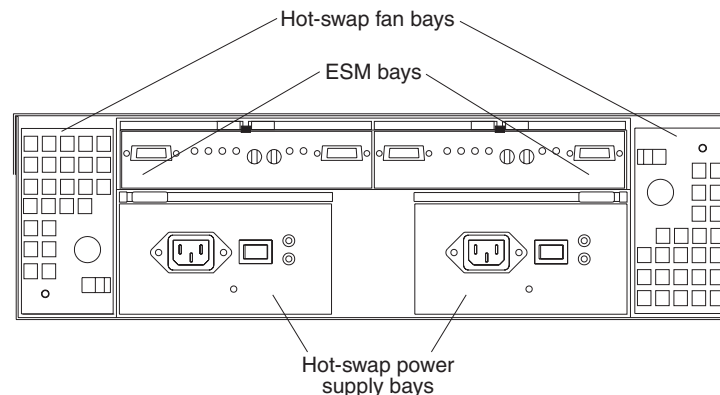
This section lists the storage unit CRUs.

Hot-swap drives: The following illustration shows the location of the hot-swap drive bays accessible from the front of your expansion unit. The storage unit contains 10 slim 40-pin FC hard disk drives. These drives come preinstalled in drive trays. This drive-and-tray assembly is called a *drive CRU* (customer replaceable unit).



Attention: Never hot-swap a drive CRU when its green Activity LED is flashing. Hot-swap a drive CRU only when its amber Fault LED is completely on and not flashing or when the drive is inactive with the green Activity LED completely on and not flashing.

Fan, ESM, and power supply CRUs: The following illustration shows the location of the hot-swap fan CRUs, the hot-swap ESM CRUs, and the hot-swap power supply CRUs.



ESM CRUs

Your storage unit comes with two hot-swappable ESM boards. The ESM boards provide a 1-Gb FC interface to the drives and monitors the overall

status of the storage unit. Each ESM board has two GBIC connector ports for connecting your storage unit to the controller or connecting two or more storage unit together. The ESM boards provide redundancy when both boards are configured into redundant FC loops.

Hot-swap fan CRUs

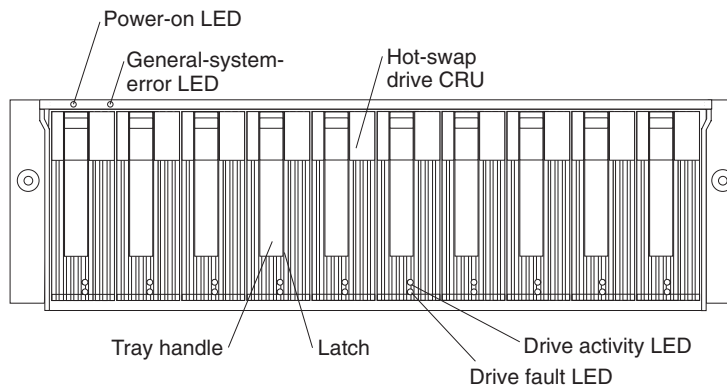
Your storage unit has two interchangeable hot-swap and redundant fan units. Each unit contains two fans. If one fan unit fails, the second fan unit continues to operate. Both fan units must be installed to maintain proper cooling within your expansion unit, even if one fan unit is not operational.

Hot-swap power supplies

Your storage unit comes with two hot-swap and redundant power supplies. Both power supplies must be installed to maintain proper cooling within your storage unit, even if one power supply is not operational.

Front controls and indicators

The primary controls on the front of the storage unit are shown in the following illustration.



Activity LED

Each drive CRU has an Activity LED. When flashing, this green LED indicates drive activity. When completely on, this green LED indicates the drive is properly installed.

Drive CRU

Your storage unit comes standard with 10 hot-swap drive CRUs. Each drive CRU consists of a hard disk drive and tray.

Fault LED

Each drive CRU has a Fault LED. When lit, this amber LED indicates a drive failure. When flashing, this amber LED indicates that a drive Identify or Rebuild process is in progress.

General system error LED

When lit, this amber LED indicates that the unit has a fault, such as in a power supply, fan unit, or hard disk drive.

Latch This multipurpose blue latch releases or locks the drive CRU in place.

Power-on LED

When lit, this green light indicates that the unit has good dc power.

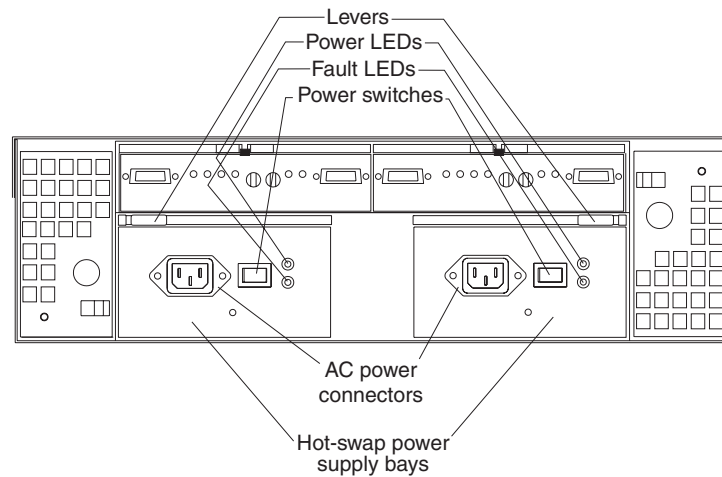
Tray handle

You can use this multipurpose handle to insert and remove a drive CRU in the bay.

Rear controls, indicators, and connectors

Two hot-swap power supply CRUs, two hot-swap fan CRUs, and two ESM boards are accessible from the back of the storage unit. These components contain several controls, indicators, and connectors.

Power supply controls, indicators, and connectors:



AC power connectors

The power cords for the power supplies connect here.

Fault LEDs

These amber Fault LEDs light if a power supply failure occurs or if the power supply is turned off.

Levers

Use these locking handles to remove or install a power supply.

Power LEDs

These green LEDs light when the storage unit is turned on and receiving ac power.

Power supply CRUs

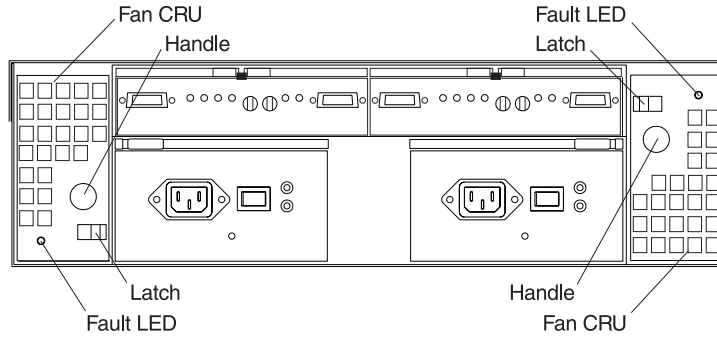
The two hot-swap power supplies are located here. Both power supply CRUs must be installed, even if one power supply is not operational.

Power switches

Use these switches to turn the power supplies on and off. You must turn both switches on to take advantage of the redundant power supplies.

Fan controls and indicators: The fans in your storage unit are hot-swappable and redundant. This means that your storage unit will continue to operate if a fan fails. It also means that you can remove and replace the fan while the storage unit is on and accessing drives.

Attention: The fans in your storage unit draw in fresh air and force out hot air. These fans are hot-swappable and redundant; however, when one fan fails, the fan unit must be replaced within 48 hours in order to maintain redundancy and optimum cooling. When you replace the failed unit, be sure to install the second fan within 10 minutes to prevent any overheating due to the lack of the additional fan unit.



Fan CRUs

The two fan CRUs are located here. These fans are hot-swappable and redundant.

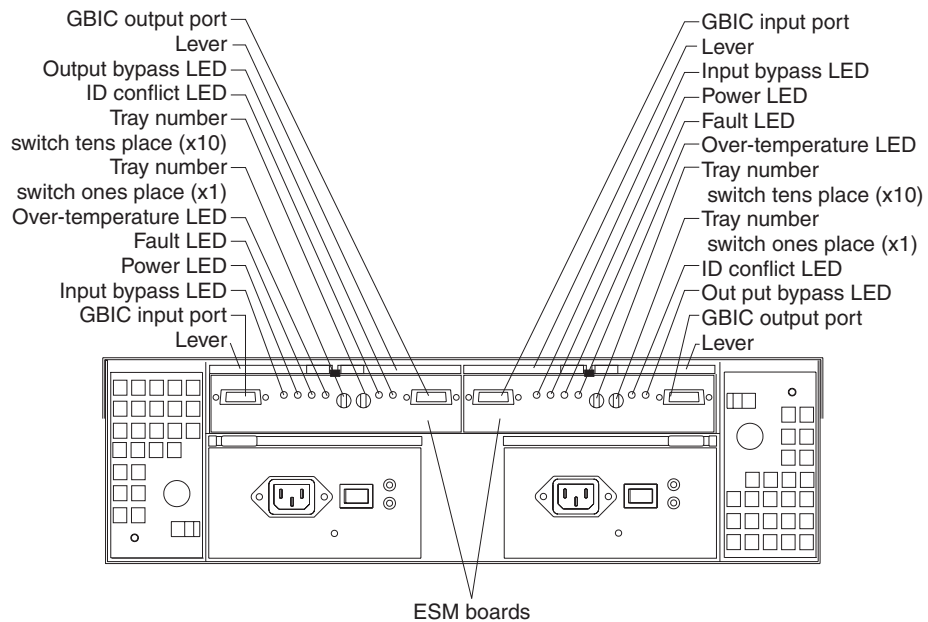
Fault LEDs

These amber LEDs light when a fan failure occurs.

Latches and handles

Use the latches and handles to remove or install the fan CRUs.

ESM boards user controls:



ESM boards

The environmental services monitor (ESM) boards contain the expansion unit controls, switches, and LEDs. Each ESM board has two GBIC ports for connecting the expansion unit to the controller.

Fault LEDs

These amber LEDs light when an ESM board failure occurs.

GBIC input ports

The two GBIC input ports are for attaching the optional GBICs to the storage unit.

GBIC output ports

The two GBIC output ports are for attaching the optional GBICs to the storage unit.

The optional GBICs (input and output) are for attaching your optical cables to the storage unit, then to the controller or additional storage unit. Insert the GBICs in the expansion unit GBIC ports and attach your FC cables to the GBICs, then connect the FC cables to the controller or additional storage unit.

ID conflict LEDs

These amber LEDs light if the storage unit tray ID settings for the ESM boards do not match. In this case, the storage unit uses the tray number of the left ESM board.

Input/Output bypass LEDs

These amber LEDs light when no valid input signal is detected and when no data is passed through the port. When no cable is connected to the port, the LEDs also light. Both ports on the ESM board are bypassed and the LEDs are lit in the event of an ESM board fault. In this case, the ESM Fault LED is also lit.

Levers

Use these levers when removing and inserting the ESM boards.

Power LEDs

These green LEDs are lit when there is power to the ESM board.

Over-temperature LEDs

These amber LEDs light if the storage unit overheats.

Tray number switches

These switches assign the physical addresses of the disk drives and the system management processors that are participating in the loop, and they identify the storage unit. The base switch (x1) sets the IDs of the disk drives on the loop. The settings of both the base ID switch (x1) and the extended ID switch (x10) together is the storage unit ID. The switches set the storage unit ID using values of 00 through 99. The base ID switch (x1) is for the ones position and the extended ID switch (x10) is for the tens position.

Fibre Channel hub Overview

The IBM NAS 300 Fibre Channel hub is an eight-port Fibre Channel hub that includes seven fixed short-wave optic ports, one gigabit interface converter (GBIC) port, and an operating system for building and managing a switched-loop architecture.

The hub is a high-performance Fibre Channel with the following characteristics:

- **Easy-to-use** — After the power-on self-test (POST) completes, you need only to add the IP address of the hub. The remainder of the hub's configuration is automated.
- **Flexible** — GBIC modules and fixed optic ports support fiber transmission media.
- **Reliable** — Hub uses highly integrated, multifunction application specific integrated circuit (ASIC) components.
- **High Performance** — Hub has a data transfer latency of less than 2 microseconds transferring data from any port to any port at peak Fibre Channel bandwidth of 100 MB per second when there is no port contention.

GBICs

Each IBM NAS 300 Fibre Channel hub accommodates one short-wavelength (SWL) GBIC module. The SWL fiber optic GBIC module, with SC connector color-coded black, is based on short-wavelength lasers supporting 1.0625 GB per second link speeds. This GBIC module supports 50-micron multimode fiber optic cables, with cables up to 500 meters in length, and 62.5-micron multimode fiber optic cables, with cables up to 125 meters in length. The GBIC module is shipped with a protective plug in place and should remain in place if no fiber optic cable is connected to the port.

Serial port connection

The Fibre Channel hub includes a serial port, which is used to set the IP address when setting up, reinitializing the Fibre Channel hub, or running diagnostics. The serial port connection is not used during normal operation.

The settings of the serial port are as follows:

- 8-bit
- No parity
- One stop bit
- 9600 baud
- Flow Control = None
- Emulation = Auto Detect

Note: The serial port and Telnet connection are mutually exclusive. There can be only one serial port session active at a time. Telnet takes priority, so the serial port is terminated when a Telnet connection is made. The serial connection is restored after the Telnet session is completed. Logging in again is required. A password is required to login to the serial port session as password checking is skipped only at initial power on.

Ethernet connection

The Ethernet port allows you to connecting the Fibre Channel hub to an existing 10/100BaseT Ethernet local area network (LAN). This Ethernet port provides the following functions:

- Provides access to the Fibre Channel hub's internal SNMP agent
- Permits remote Telnet and Web access for remote monitoring and testing
- Permits the setting or changing of the IP address

Note: The Ethernet port is only for Telnet, SNMP agent, and the Web-based server access. No fabric connection is used with this connection.

Supported software applications

For a list of the pre-loaded and optional software applications that are supported by your IBM NAS 300, refer to the *IBM TotalStorage Network Attached Storage 300 User's Reference*.

Chapter 2. Installation

This chapter describes how to install the IBM TotalStorage Network Attached Storage 300.

Unpacking

This section provides unpacking information for the IBM NAS 300 rack cabinet.

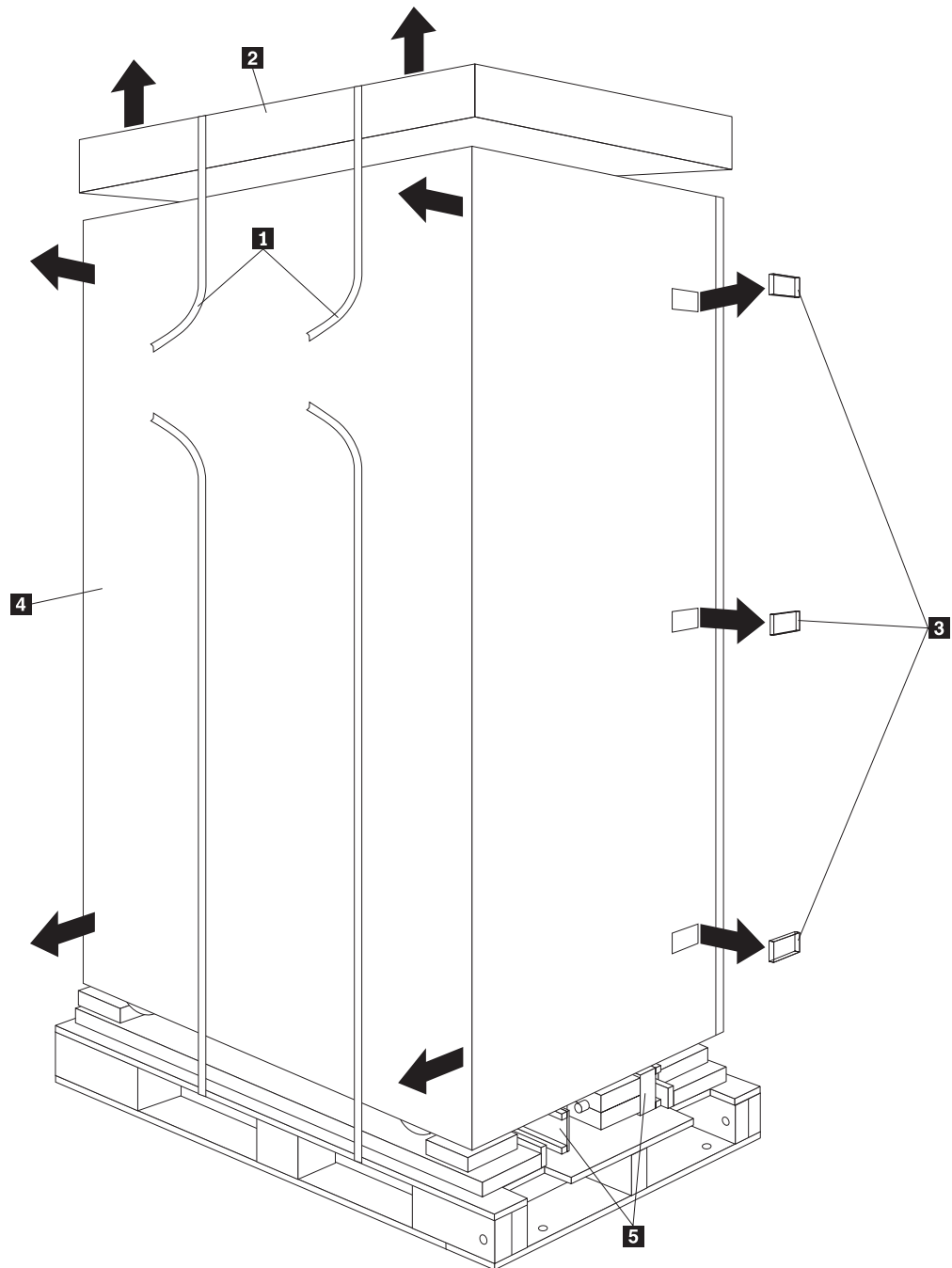
Note: You need a minimum of 3 m (10 ft) in front of the pallet to properly unpack the rack cabinet.

Tool requirements and rack contents

You will need a utility knife or scissors to properly unpack the rack cabinet. The IBM NAS 300 rack package contains the following components:

- IBM NAS 300 rack
 - Front and rear rack doors
 - Side panels
- Keys for the rack doors (located inside the rack cabinet on the right-front rail)
- Wrench to remove the pallet bolts and adjust the leveling feet (attached to the top of the box inside the rack)
- Box that contains miscellaneous parts kit (located inside the rack cabinet on the bottom)
 - One front stabilizer bracket and mounting bolts
 - Two support bars (for use if you remove the top 6U portion)
 - Miscellaneous parts kit (includes spare clip nuts for you to install optional devices)

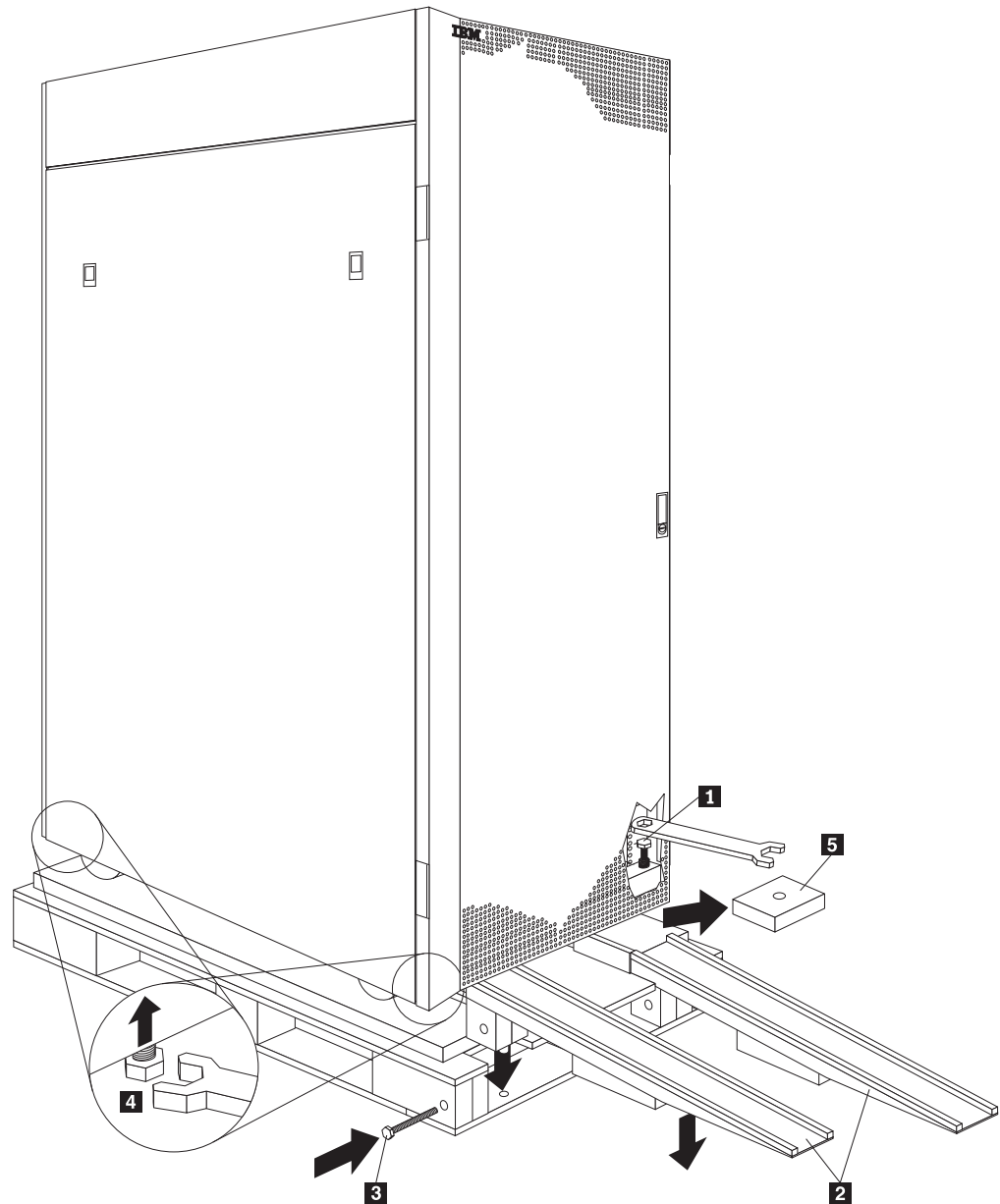
Removing the packing materials



To remove the protective packaging from the rack cabinet, perform the following steps:

1. Carefully cut the bands **1** with a utility knife or scissors.
2. Remove the cardboard top cover **2** and packing material.
3. Remove the six clips **3** (three in the front and three in the rear); then, remove the cardboard side protectors. **4**
4. Remove the corner, side, and top protectors; then, lift the plastic bag over the top of the rack cabinet.
5. Remove the ramps **5** from where they are stored under the rack cabinet.

Removing the rack cabinet from the pallet



Note: The following procedure requires at least two people.

To remove the protective packaging from the rack cabinet, perform the following steps:

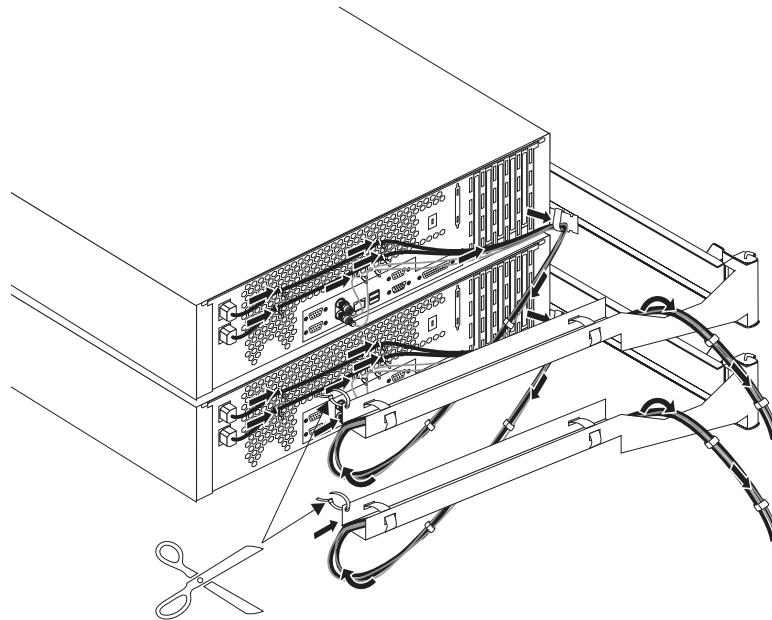
1. Open the rack doors and locate the wrench on top of the box inside the rack cabinet.
2. Remove the four bolts **1** (one at each corner) that secure the rack cabinet to the pallet. Save two of the bolts for use with the ramps in step 4.
3. Close the rack doors; then, insert the two ramps **2** into place in front of the pallet. Make sure you insert the ramps completely into the slots on the pallet.
4. Insert the bolts **3** that you removed in step 2 (one bolt for each ramp).
5. Raise the rack leveling feet **4** (one per corner) enough to remove the four corner blocks **5** and allow the rack cabinet to roll on its casters.

6. Carefully roll the rack cabinet down the ramp to the installation site.

Removing the shipping protection

When you locate the IBM NAS 300 in its final location, remove the IBM NAS 300 shipping protection by performing the following steps:

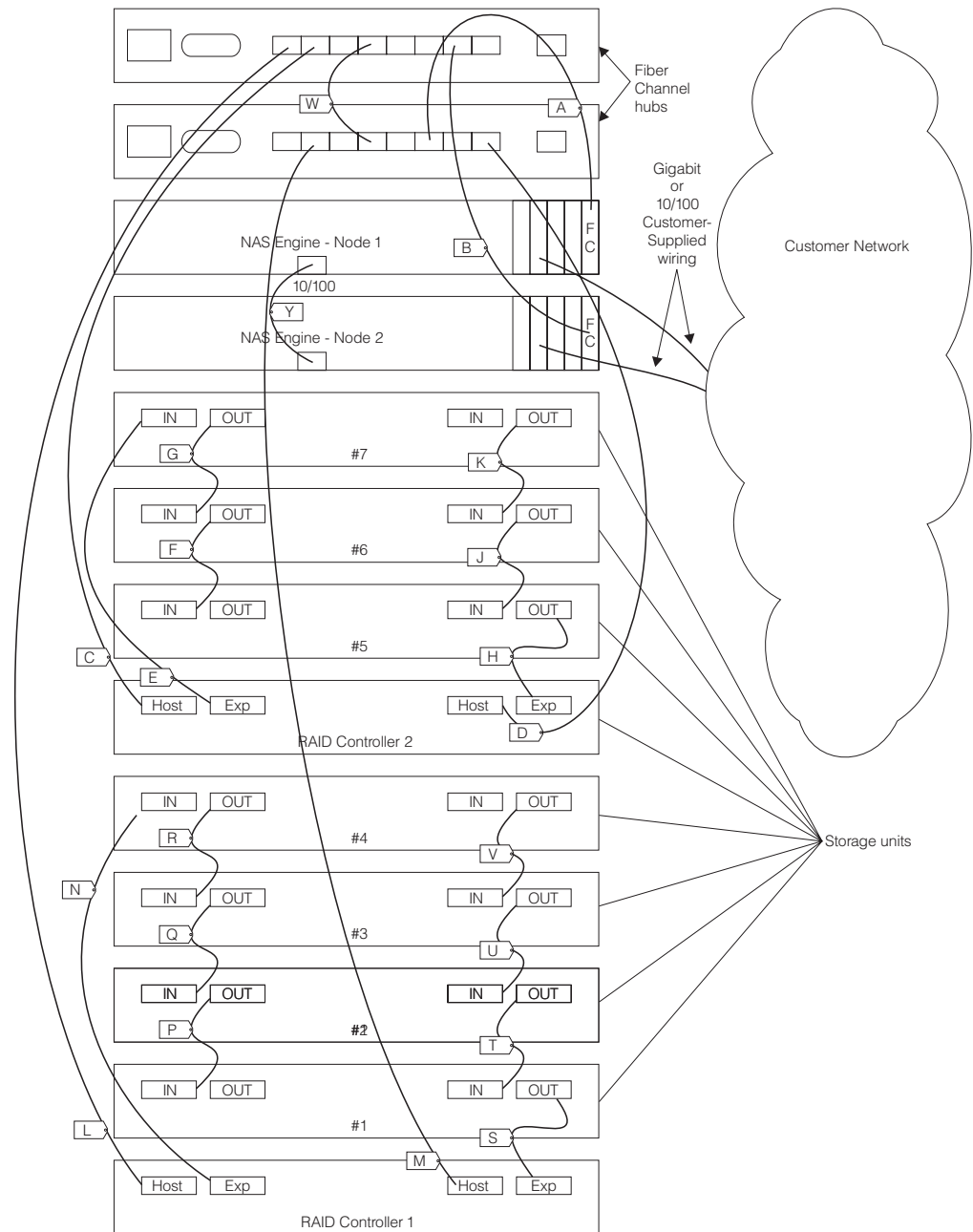
1. Open the rear rack door and use a utility knife or scissors to cut and remove the two heavy plastic ties that secure the two cable-management arms to the rack being careful not to damage the cables.



2. Open the front rack door and remove the shipping tape from the front panel of every RAID storage controller and storage unit installed in the rack. After you remove the tape ensure that all the drive filler-panels (between the drives) are securely in place.

Cabling the IBM NAS 300

The following illustration shows a fully-configured IBM NAS 300 and shows how the various IBM NAS 300 components are connected together.



Cabling the IBM NAS 300 consists of connecting your network cables to the IBM NAS 300 engines and then connecting the two 230-V 3-phase power cords. For network cables, you can use fiber-optic cables and connect to an optional Ethernet Gigabit adapter or use category-5 cables and connect to an optional Ethernet 10/100 adapter.

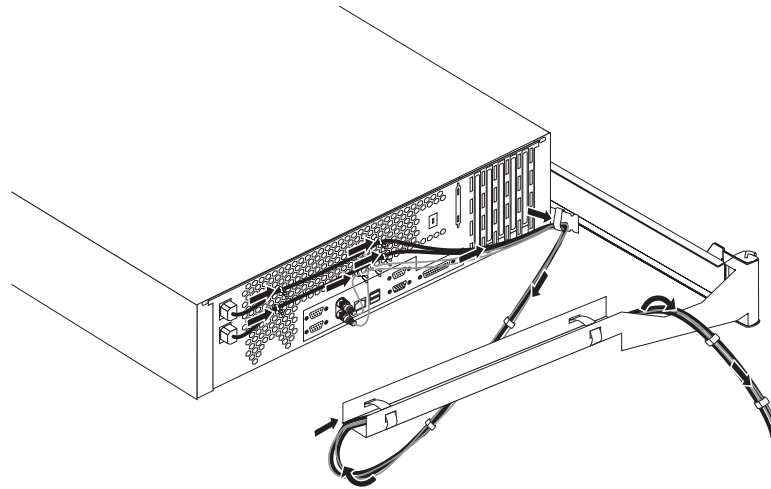
For specific information about location and cable numbering of IBM NAS 300 ac power cords, see “Appendix C. Power Cable Placement” on page 79. For

information about location and installation of IBM NAS 300 signal cables, see “Appendix D. Signal Cable Placement” on page 81.

After you attach all your cables, use the instructions that are provided in “Powering the IBM NAS 300 on and off” on page 25 for the initial startup of the storage server.

Cabling the engines

When you cable the engines, be sure to route the network cables through the cable-restraint brackets on the rear of the engines.



Cabling the Fibre Channel hubs

All network cable connections are made to the front panel of the Fibre Channel hubs. All recommended cabling supports the 100 MB per second transfer rate. Table 3 shows the cable requirements.

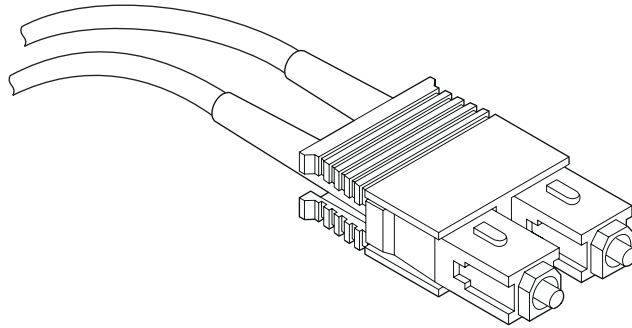
Table 3. Fibre Channel cable specifications

Cable Type	Specification	Maximum length	GBIC module optical wavelength
SWL, fiber optic	<ul style="list-style-type: none">• Duplex SC plug connectors• Multimode fiber• 50 mm core diameter• 125 mm cladding diameter duplex cable	500 meters (1641 feet)	780-860 nm without open fiber control (non-OFC)

Note: To prevent damage to the housing or prevent scratching the fiber optic end, use extreme care when removing or installing connectors. To prevent contamination, always install protective covers on unused or disconnected components.

Attention: When removing the protective plug from the GBIC or fiber optic ports, do not force the fiber optic plug into the GBIC or fiber optic ports module. This can damage the connector, the GBIC or fiber optic ports, or both. Make sure the fiber surface is clean and free of dust or debris before inserting the connector into the GBIC or fiber optic ports.

Fiber cable connections are made to the front panel of the Fibre Channel hub using standard dual SC plug connectors as shown in the following diagram.



The connectors are keyed and must be inserted into the GBIC module's connector with the proper alignment. In most cases, one of the two connector plugs is a different color to aid in proper connector alignment.

Cabling the RAID storage controller

This section provides information about Fibre Channel cables and how they attach to the RAID storage controller.

Note: Because your IBM NAS 300 comes with all power and signal cables pre-attached, you will only need to attach cables to the RAID storage controller if you add additional disk drives or replace a defective cable.

Working with GBICs and fiber-optic cables

Each RAID storage controller contains two RAID controllers. Each RAID controller has one host port and one expansion port. A GBIC is used to connect each host port and expansion port to hosts and expansion units. The GBIC is inserted into the port, and then a fiber-optic cable is inserted into the GBIC. The other end of the fiber-optic cable connects to either the Fibre Channel hub or a storage unit.

Installing GBICs: Observe the following GBIC installation tips:

- The GBIC module housing has an integral guide key to prevent you from inserting the GBIC improperly.
- Use minimal pressure when inserting the GBIC into a port. Forcing the GBIC into a port could cause damage to the GBIC or the port.
- GBICs are hot pluggable. You can insert or remove the GBIC while the storage server is powered on.
- The operational loop performance is not affected when you install or remove a GBIC.
- You must connect the fiber-optic interface cable to the GBIC module after you insert the GBIC into the port.

Statement 3



Statement 3

CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



Danger

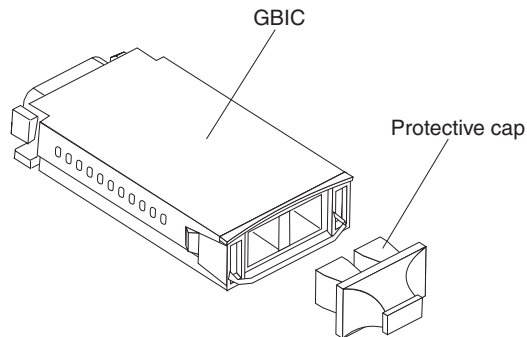
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Note: For safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

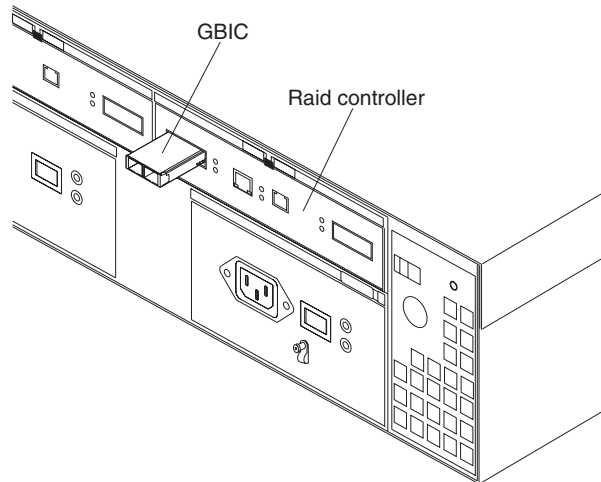
To install a GBIC, perform the following steps:

1. Remove the protective cap from the GBIC, as shown in the following illustration.



2. If the GBIC that you are installing has a metal latch, move the latch to the unlocked (center) position.

3. Insert the GBIC into the host or expansion port on the RAID controller, as shown in the following illustration.



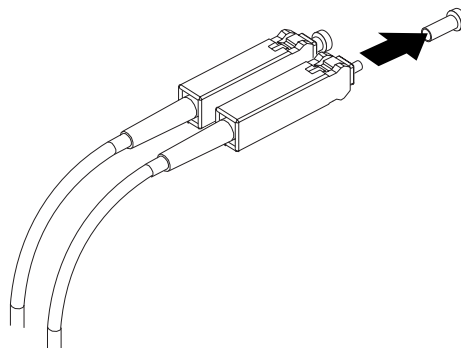
4. After the GBIC is inserted into the port completely, rotate the GBIC latch outward to the locked position (flush with the rear of the GBIC).

Installing fiber-optic cables: To connect the fiber-optic cables, perform the following steps:

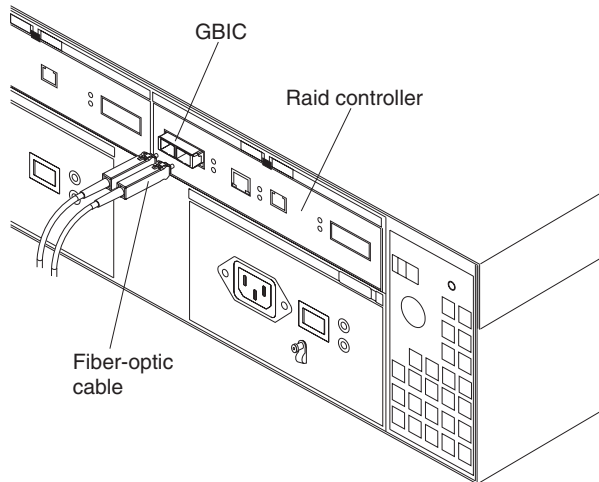
Attention: To avoid damage to your fiber-optic cables, follow these guidelines:

- Do not route the cable along a folding cable-management arm.
- When attaching fiber-optic cables to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius smaller than 76 mm (3 in.) when extended or become pinched when retracted.
- Route the cable away from places where it can snag on other devices in the rack.
- Do not overtighten the cable straps.
- Do not put excess weight on the cable at the connection point and be sure that it is well supported.

1. Remove the protective caps from the fiber-optic cable.



2. Connect the fiber-optic cable to the installed GBIC, as shown in the following illustration.



3. Check the LEDs on the RAID controller. When the RAID controller is operating properly, the amber Fault LED is off. For information about the status of the RAID controller LEDs, see the *User's Reference*.

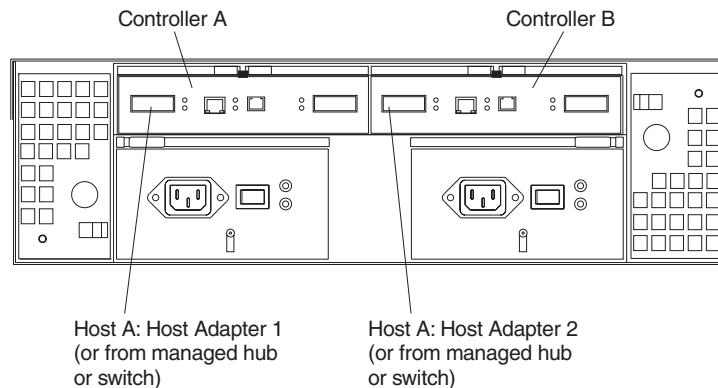
To remove the fiber-optic cables and GBICs, perform the following steps:

1. Gently pull the fiber-optic cable from the GBIC; then, replace the protective caps.
2. Move the metal latch on the GBIC to the unlocked (center) position.
3. Gently pull the GBIC out of the port; then, replace the protective cap.

Connecting the RAID controllers to the Fibre Channel hubs

To connect the RAID controllers to the Fibre Channel hubs, perform the following steps:

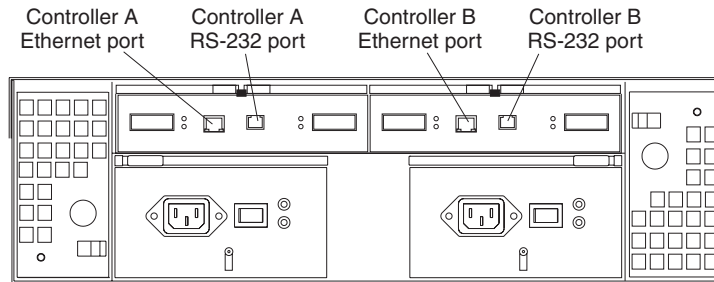
1. Install a GBIC in the host ports on the RAID controllers.
2. Connect the host-system cable from one RAID controller (Controller A) to one of the Fibre Channel hubs. Connect the host-system cable from the other RAID controller (Controller B) to the other Fibre Channel hub. The following illustration shows the location on the RAID controllers where the host-system cables connect.



Connecting secondary interface cables

Use the Ethernet interface ports on the back of the RAID controller to connect the controllers for direct management of the storage subsystems. Connect a pair of

Ethernet cables from the storage-management station to the Ethernet ports for Controller A (located on the left) and Controller B (located on the right) on the back of the RAID controller. The following illustration shows the location of the ports.



Note: The serial (RS-232) interface ports are intended to be used by service technicians to perform diagnostic operations on the RAID controller.

Connecting additional expansion units

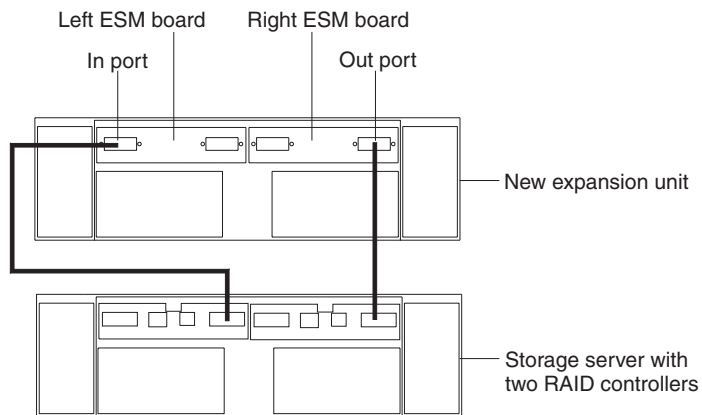
After you install the RAID storage controller, you can connect additional storage units. You can do this at any time after you install the RAID storage controller, even while it is powered on and processing data. You can even install one storage unit now, and an additional storage unit later.

Attention: You can add only *new* storage units to the RAID storage controller. This means that there must be no existing configuration information on the storage unit you want to install. If the storage unit that you want to install currently contains logical drives or configured hot spares, you must delete them before connecting the storage unit to the RAID storage controller.

To connect an additional storage unit, perform the following steps:

1. Follow the instructions in your storage unit installation manual to set up and mount the new storage unit.
2. Use the following procedure to connect a single storage unit to the RAID storage controller:
 - a. Use a fiber-optic cable to connect to the FC-Storage Unit port on the left RAID controller in the RAID storage controller to the In port on the left ESM board of the storage unit.
 - b. Use a second fiber-optic cable to connect the FC-Storage Units port on the right RAID controller in the RAID storage controller to the Out port on the right ESM board of the storage unit.

- c. Ensure that the left and right ESM board IDs (switch settings) are set to an identical value.

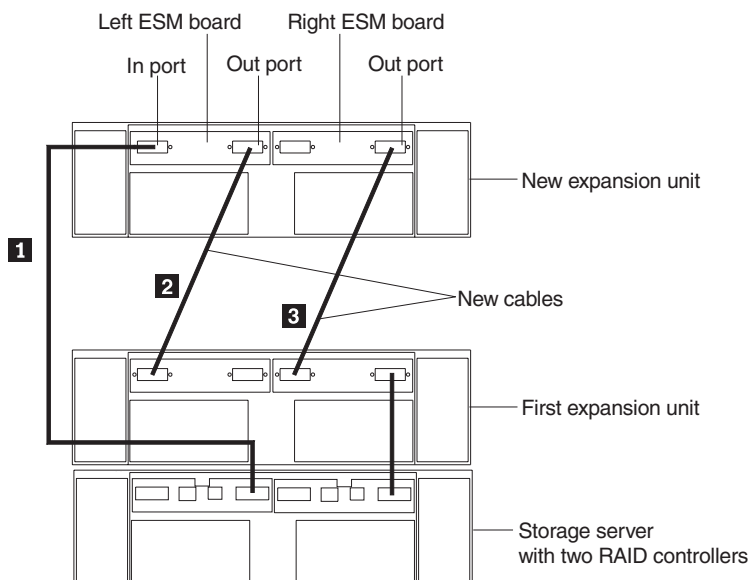


After you complete all connections, the RAID storage controller locates the new drives.

3. Use the storage-management software to check the status of the new drives, correct any errors found, and configure the new drives.

Use the following procedure to connect a second storage unit to the RAID storage controller after previously adding the first expansion unit.

1. Disconnect cable **1** from its current connection and connect it to the In port on the left ESM board on the new expansion unit.
2. Connect cable **2** to the In port you disconnected in step 1 and the Out port on the left ESM board on the new expansion unit.
3. Connect a third cable **3** to the In port on the right ESM board on the first expansion unit and the Out port on the right ESM board on the new expansion unit.
4. Make sure that each expansion unit has a unique ID (switch setting) and that the left and right ESM board switch settings on each expansion unit are set to an identical value.



After you complete all connections, the RAID storage controller locates the new drives.

5. Use the storage-management software to check the status of the new drives, correct any errors found, and configure the new drives.

Cabling the storage unit

Cabling a storage unit is similar to cabling a RAID storage controller, see “Cabling the RAID storage controller” on page 19.

Note: The storage unit provides redundant loop support. A redundant storage unit loop consists of one or more storage unit connected to a host (controller) using two sets of FC cables. If one FC fails, the host will use the other storage unit loop to maintain I/O to the storage unit array group.

Powering the IBM NAS 300 on and off

This section contains instructions for powering the IBM NAS 300 on and off under normal and emergency situations.

If you are powering on the IBM NAS 300 after an emergency shutdown, see “Restoring power after an emergency” on page 26.

Powering on the IBM NAS 300

Use this procedure to power on the IBM NAS 300.

1. Power on any Uninterruptible Power Supplies (UPS) that you powered off in the powering off procedure, and allow it to return to normal operation.
2. Power on any network hubs or switches.
3. Power on all 5192 Network Attached Storage Storage Units and 3534 Managed Hubs. Give the 3534 Managed Hubs about three minutes to start up.
4. Power on each 5191 RAID Storage Controller. After about three to four minutes, the storage controllers will have completed their startup routine. You can verify this by making sure that for each drive in the storage controller and for each drive in the storage unit, the status LED (on the top front of the drive) is solid green (not blinking) for at least five seconds.
5. Power on the node that you shut down *last* in the powering off procedure.
6. Once the node comes up, start Cluster Administrator on that node and make sure that all resources are in an online state or shortly return to that state.
7. If no problems exist and all clustered resources are online, power on the node that you shut down *first* in the powering off procedure. Each resource for which that node is the preferred owner will fail back to that node and return to an online state.

Powering off the IBM NAS 300

Use this procedure to power off:

1. Make note of the order in which you shut down the nodes.
You shut the nodes down one at a time, and in the powering on procedure you start the nodes in the opposite order in which you powered them off.
2. On the node you want to shut down last (the second node), click **Cluster Administration**, located in IBM NAS Admin, in the Cluster Tools folder. If prompted for a cluster name, enter the name of the cluster, and then click **Open**. Make sure that all resources are in the online state.
3. With all clustered resources in the online state, on the node you want to shut down first (the first node), go to **Start, Shut Down** and select **Shut down** from the drop down menu. Click **OK**.

4. On the second node, in Cluster Administrator, wait for all resources to fail over to that node and return to the online state.
5. Once all resources are in the online state, and the first node has shut down, on the second node go to **Start, Shutdown** and select **Shut down** from the drop down menu. Click **OK**.
6. Once both nodes have shut down, power off each 5191 RAID Storage Controller by pressing the two power switches located on the rear of the unit.
7. Power off all 5192 Network Attached Storage Storage Units and 3534 Managed Hubs.
8. You may power down any network hubs or switches that are used exclusively by the IBM NAS 300. If they are used by other network attached devices, do not power these off.
9. You may also power off any UPS that regulates power for the IBM NAS 300, provided that no other equipment that you wish to keep powered on is plugged into the same UPS.

Emergency Shutdown

This section contains instructions for emergency circumstances.

If you are turning on the IBM NAS 300 after an emergency shutdown or power outage, refer to “Restoring power after an emergency”.

Performing an emergency shutdown: Attention: Emergency situations might include fire, flood, extreme weather conditions, or other hazardous circumstances. If a power outage or emergency situation occurs, always turn off all power switches on all computing equipment. This will help safeguard your equipment from potential damage due to electrical surges when power is restored. If the IBM NAS 300 loses power unexpectedly, it might be due to a hardware failure in the power system.

Use this procedure to shut down during an emergency.

1. If you have time, stop all activity and check the LEDs (front and back). Make note of any Fault LEDs that are lit so you can correct the problem when you turn on the power again.
2. Turn off all power supply switches; then, unplug both external power cords from the IBM NAS 300.

Restoring power after an emergency: Use this procedure to restart the IBM NAS 300 if you turned off the power supply switches during an emergency shut down, or if a power failure or a power outage occurred.

1. After the emergency situation is over or power is restored, check the IBM NAS 300 for damage. If there is no visible damage, continue with Step 2; otherwise, have your system serviced.
2. After you have checked for damage, ensure that the power switches are in the off position; then, plug in the external power cord.
3. Turn on the power to each device, based on the startup sequence.
4. Turn on both power supply switches on the back of the RAID storage controllers and storage units.
5. Only the green LEDs on the front and back and the amber Bypass LEDs for unconnected GBIC ports should remain on. If other amber Fault LEDs are on, refer to *User’s Reference* for instructions.
6. Use your installed software application as appropriate to check the status of the IBM NAS 300.

Checkout

After powering on all the components of your IBM NAS 300, refer to Table 4 to verify that all the components have completed their POST tests and are operational. If you do not have the correct LED displays, refer to the *User's Reference*.

Table 4. LED Displays

Component	LED Display
Engine	System LED on. Link OK on but all other operator information panel lights off.
Fibre Channel Hub	Power On indicator is green.
RAID Storage Controller	Power On indicator is green and General-System-error LED is off. The Drive Fail LED is off on each drive unit.
Storage Unit (optional)	Power On indicator is green and General-System-error LED is off. The Drive Fail LED is off on each drive unit.

Chapter 3. Installing and replacing IBM NAS 300 components

This chapter describes how to add optional components to your IBM NAS 300 such as adapters to the IBM NAS 300 engines, an additional RAID storage controller, and additional storage units. It also describes procedures on replacing defective subcomponents, such as power supplies, fans, adapters, and so on.

Safety information

Before you begin adding or replacing components, read the safety information found in “Appendix I. Safety and environmental notices” on page 105.

Before you begin

Before you begin to install options in your IBM NAS 300, read the following information:

- Become familiar with the safety and handling guidelines specified under “Handling static-sensitive devices”, and read the safety statements in “Appendix I. Safety and environmental notices” on page 105. These guidelines will help you work safely while adding or replacing components.
- You do not need to power off the a IBM NAS 300 devices to replace the hot-swap hard disk drive, fans, or power supplies.
- The orange color on components and labels in your IBM NAS 300 indicates hot-swap components. This means that you can install or remove the component while the system is running, provided that your system is configured to support this function. For complete details about installing or removing a hot-swap component, see the information provided in this chapter.
- The blue color on components and labels identifies touch points where a component can be gripped, a latch moved, and so on.
- Make sure that you have an adequate number of properly grounded electrical outlets.
- Back up all important data before you make changes to disk drives.

Handling static-sensitive devices

When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

Working inside a IBM NAS 300 component while power is on

Your IBM NAS 300 is designed to operate safely while powered on. Follow these guidelines when you work inside a component that is powered on:

- Avoid loose-fitting clothing on your forearms. Button long-sleeved shirts and do not wear cuff links while you are working inside a component.
- Do not allow your necktie or scarf to hang inside the component.
- Remove jewelry, such as bracelets, rings, necklaces, and loose-fitting wrist watches.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that:

- All covers and filler plates are in place during normal operations.

- A removed hot-swap hard disk drive is replaced within two minutes of removal.
- If optional adapters are added to the IBM NAS 300 engines, cables for these adapters are routed according to the instructions provided with the adapters.
- A failed fan in any of the IBM NAS 300 units is replaced within 48 hours.

Installing and replacing IBM NAS 300 engine components

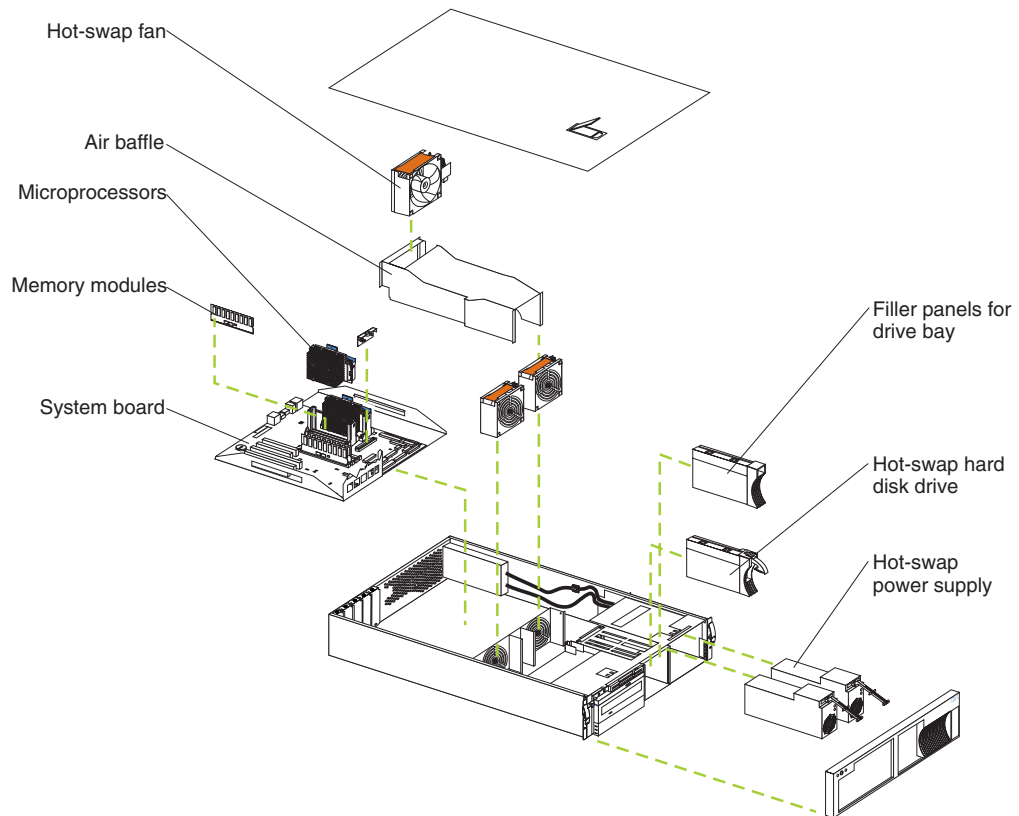
This section provides information and procedures necessary to install and replace IBM NAS 300 engine components.

Attention: When working on the IBM NAS 300, make sure you only pull out only one engine at a time from its secured position in the rack. Pulling out only one engine at a time allows the cable-restraint arms to maintain proper cable positioning.

Major components

The following illustration shows the major components of the IBM NAS 300 engine.

Note: The illustrations in this document might differ slightly from your hardware.

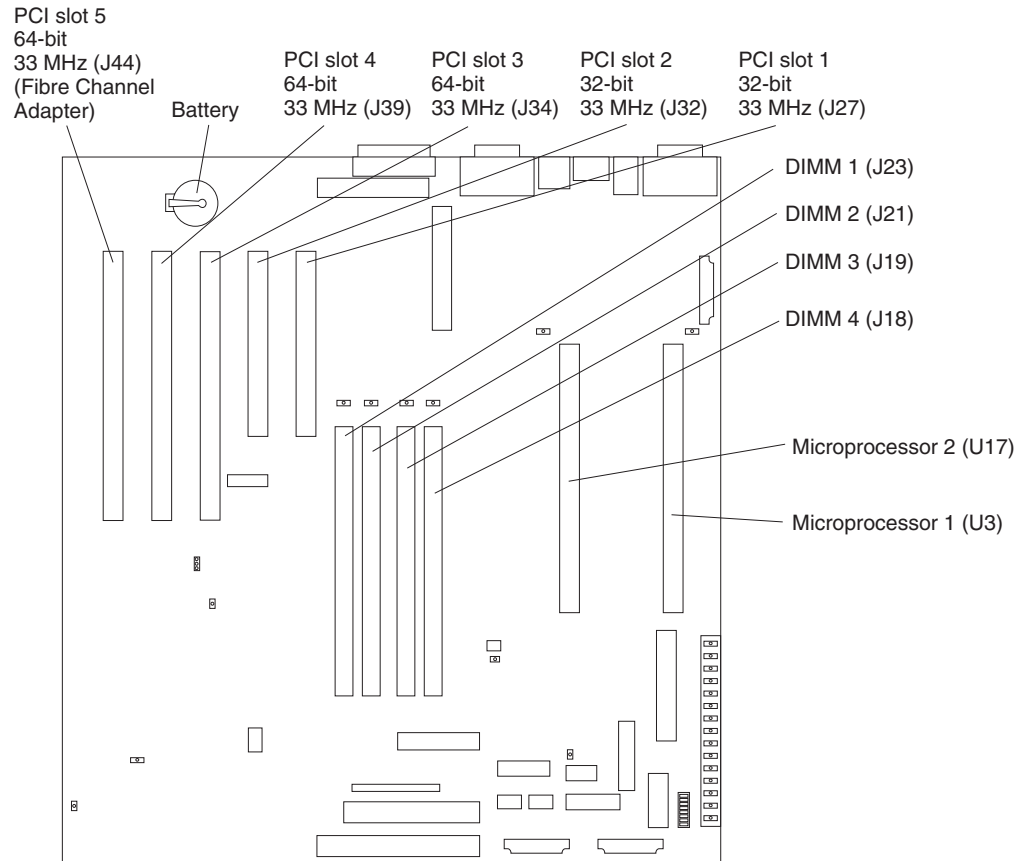


The illustrations in the following sections show the connectors, switches, and LEDs on the system board.

System board option connectors

The following illustration identifies system-board connectors for user-installable options or user-replaceable components.

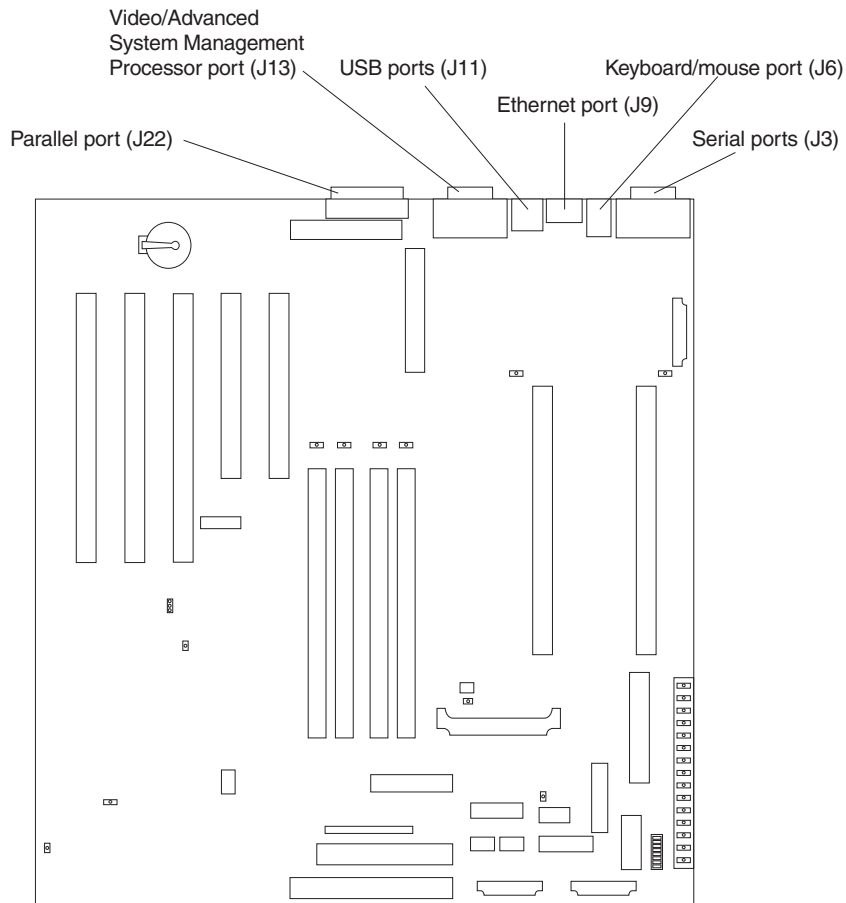
Note: The illustrations in this document might differ slightly from your hardware.



System board external port connectors

The following illustration shows the external port connectors on the system board.

Note: The illustrations in this document might differ slightly from your hardware.



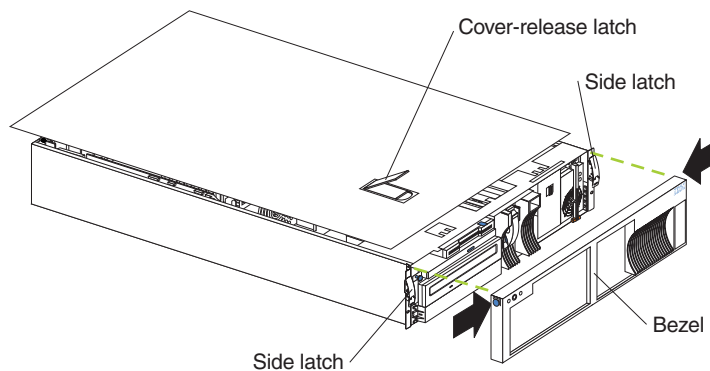
Installation and replacement procedures

This section describes how to add or remove internal components.

Removing the cover and bezel

Refer to the following illustration to remove the cover and bezel.

Note: The illustrations in this document might differ slightly from your hardware.



To remove the top cover, perform the following steps:

1. Review the information in “Before you begin” on page 29.

2. Release the left and right side rack latches and pull the engine out of the rack enclosure until both side rails lock.
3. Lift the cover-release latch. Lift the cover off and set the cover aside.
Attention: For proper cooling and airflow, replace the cover before powering on the engine. Operating the engine for extended periods of time (over 30 minutes) with the cover removed might damage components.

To remove the bezel, perform the following steps:

1. Press in on the top sides of the bezel and pull the bezel away from the front.
2. Store the bezel in a safe place.

Installing optional adapters

See page 31 for the location of the PCI expansion slots on the system board.

Note: The illustrations in this document might differ slightly from your hardware.

Adapter considerations: Before you install any adapters:

- Determine which expansion slot you will use for the adapter.
 - The second IBM FAStT Host Adapter (Fibre Channel) must be installed in slot 4, a 64-bit PCI slot.
 - The first IBM Gigabit Ethernet Server Adapter must be installed in slot 3. If you are installing a second IBM Gigabit Ethernet Server Adapter, it must be installed in slot 4. Both slot 3 and slot 4 are 64-bit PCI slots.
 - An IBM 10/100 Ethernet Server Adapter can be installed in any open PCI slot (either a 32-bit or a 64-bit PCI slot).
 - The Netfinity® Advanced System Manager PCI Adapter must be installed in PCI slot 1, a 32-bit PCI slot.

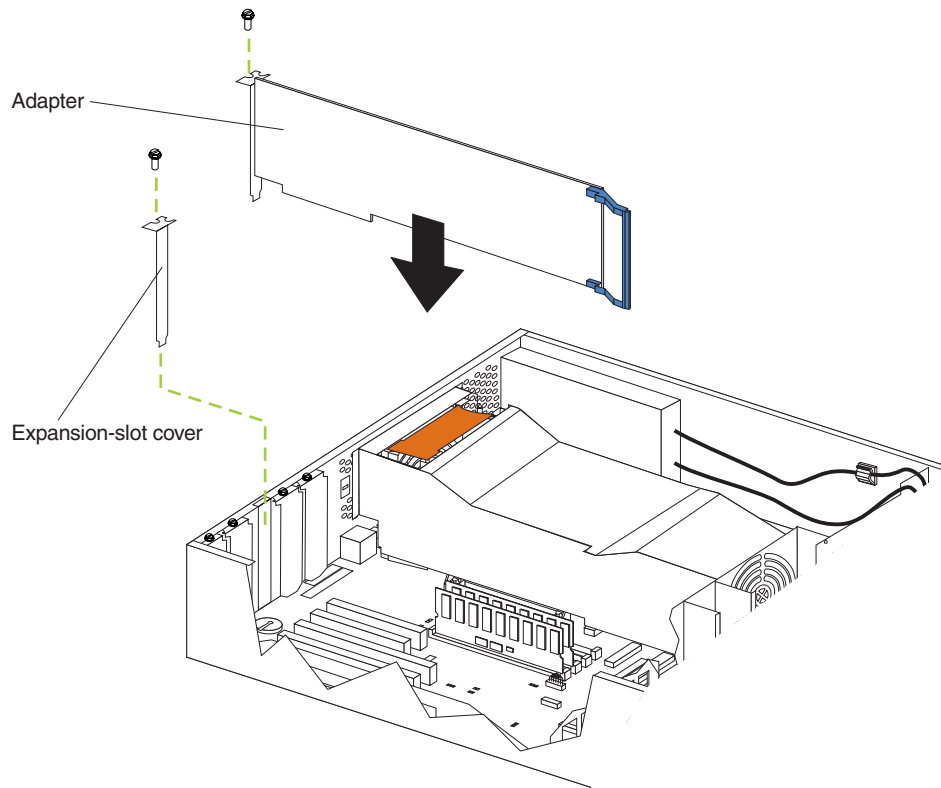
For more information about determining which PCI slot to use, see “Appendix B. PCI Adapter Placement” on page 77.

- Have a small, flat-blade screwdriver available.

Attention: Check the instructions that come with the adapter for any requirements or restrictions.

Installing an adapter: Refer to the following illustration to install an adapter.

Note: The illustrations in this document might differ slightly from your hardware.



To install an adapter, perform the following steps:

Attention: When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105.
2. Power off the engine and disconnect all external cables and power cords.
3. Remove the top cover.
4. Remove the expansion-slot cover:
 - a. Loosen and remove the screw on the top of the expansion-slot cover.
 - b. Slide the expansion-slot cover out of the engine. Store it in a safe place for future use.

Attention: Expansion-slot covers must be installed on the openings for all vacant slots. This maintains the electromagnetic emissions characteristics of the system and ensures proper cooling of system components.

5. Remove the adapter from the static-protective package.

Attention: Avoid touching the components and gold-edge connectors on the adapter.
6. Place the adapter, component-side up, on a flat, static-protective surface.
7. Install the adapter:
 - a. Carefully grasp the adapter by its top edge or upper corners, and align it with the expansion slot on the system board.
 - b. Press the adapter *firmly* into the expansion slot.

Attention: When you install an adapter in the engine, be sure that it is completely and correctly seated in the system-board connector before you apply power. Incomplete insertion might cause damage to the system board or the adapter.

- c. Insert and tighten the expansion-slot screw on the top of the adapter bracket.
8. Connect any needed cables to the adapter. For information on adapter cable requirements, see “Appendix A. IBM NAS 300 Engine communication adapters” on page 73.

Attention: Route cables so that the flow of air from the fans is not blocked.

9. If you have other options to install, do so now; otherwise, go to “Installing the cover and bezel” on page 46.

Note: You can install up to four optional adapters on each engine.

Replacing the hard disk drive

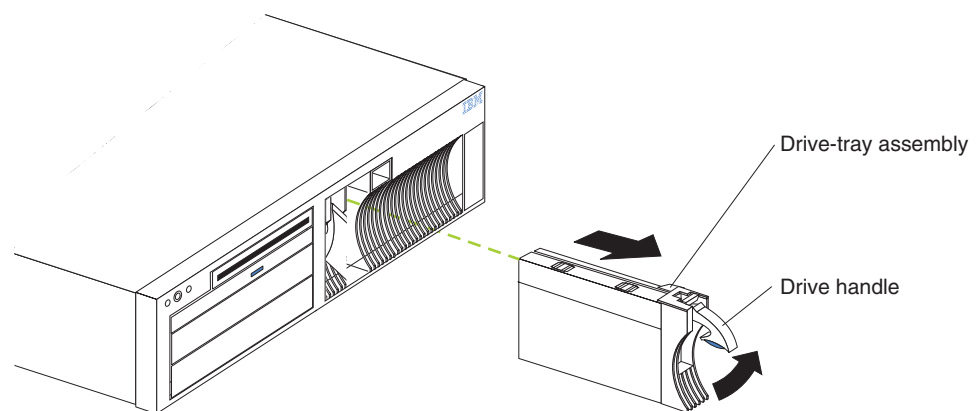
This section gives the procedure for replacing a defective hard disk drive.

Notes:

1. To minimize the possibility of damage to the hard disk drive, leave the engine in the rack while replacing the hard disk drive.
2. You do not have to turn off the engine to install hot-swap drives. However, you must turn off the engine when performing any steps that involve installing or removing cables.

Refer to the following illustration to replace a hard disk drive.

Note: The illustrations in this document might differ slightly from your hardware.



To replace a hard disk drive, perform the following:

Attention: When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

1. Review the information in “Before you begin” on page 29.

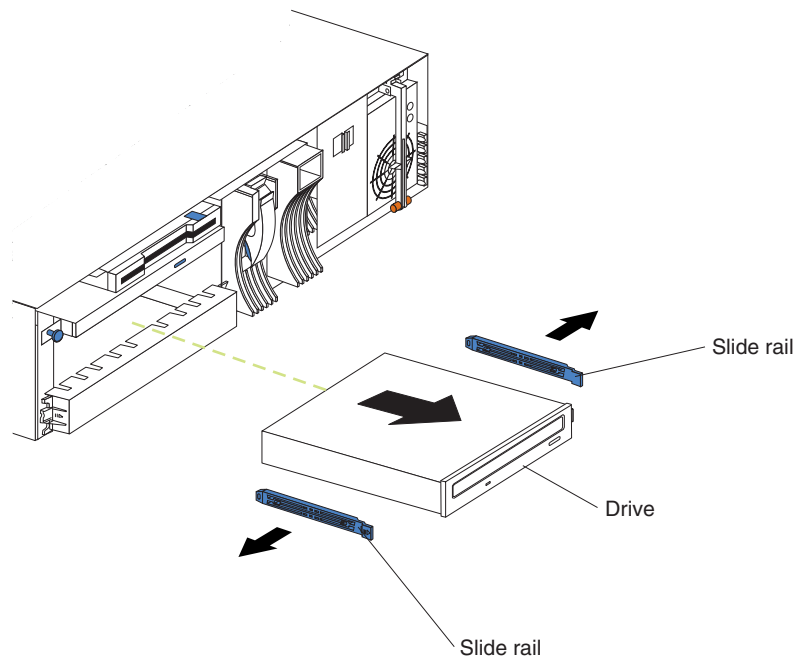
Attention: To maintain proper system cooling, do not operate the engine for more than two minutes without either a drive or a filler panel installed.

2. Lift up on the tray handle until it unlocks.

3. Gently pull the drive-tray assembly out of the bay until the drive disconnects from the backplane and then slide the drive assembly out of the engine.
4. Install a new hard disk drive:
 - a. Ensure the tray handle is open (that is, perpendicular to the drive).
 - b. Align the drive-tray assembly with the guide rails in the bay.
 - c. Gently push the drive-tray assembly into the bay until the drive connects to the backplane.
 - d. Push the tray handle down until it locks.
5. Check the hard disk drive status indicators to verify that the hard disk drive is operating properly.
 - When the amber light is on continuously, the drive has failed.
 - The green activity light flashes when there is activity on the drive.

Replacing the CD-ROM drive

Note: The illustrations in this document might differ slightly from your hardware.



To replace a defective CD-ROM drive, perform the following steps:

Attention: When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105.
2. Power off the engine and then remove the cover and bezel. (See “Removing the cover and bezel” on page 32.)
3. If the drive that you are replacing is a laser product, observe the following safety precaution.

**CAUTION:**

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

**DANGER**

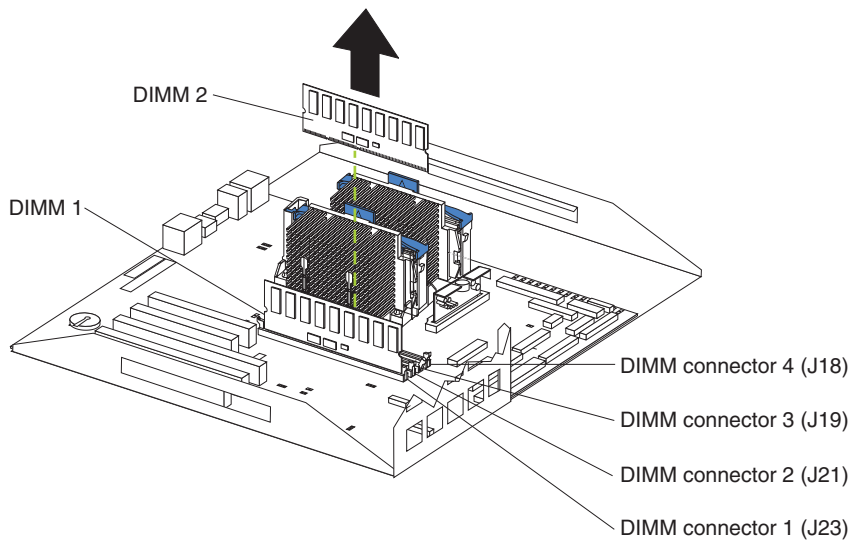
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following. Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Note: safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

4. Remove the cable connecting the CD-ROM drive to the IDE connector on the system board.
5. Slide out the old CD-ROM drive from the engine.
6. Touch the static-protective bag containing the drive to any unpainted metal surface on the engine; then, remove the new drive from the bag and place it on a static-protective surface.
7. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
8. Install rails on the drive.
 - Remove the blue slide rails off the old CD-ROM drive.
 - Clip the rails onto the sides of the new drive.
9. Place the drive so that the slide rails engage in the bay guide rails. Push the drive into the bay until it clicks into place.
10. Reconnect the cable from the CD-ROM drive to the IDE connector on the system board.
11. Set the jumper on the back of the new drive to slave.

Installing or replacing memory modules

Your IBM NAS 300 engine comes fully configured with one 1 GB of memory, but to improve performance in certain environments, you can install an additional 1GB of memory.



To install a new DIMM, perform the following steps:

Attention: When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105. Also review the documentation that comes with your option.
2. Power off the engine and remove the cover. (See “Removing the cover and bezel” on page 32.)
3. Touch the static-protective package containing the DIMM to any unpainted metal surface on the engine. Then, remove the DIMM from the package.

Note: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

4. Turn the DIMM so that the pins align correctly with the connector.
5. Insert the DIMM into the connector by pressing on one edge of the DIMM and then on the other edge of the DIMM. Be sure to press straight into the connector. Be sure that the retaining clips snap into the closed positions.
6. Make sure that the retaining clips are in the closed position. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

To replace a DIMM, perform the following steps:

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105. Also review the documentation that comes with your option.
2. Power off the engine and remove the cover. (See “Removing the cover and bezel” on page 32.)
3. Touch the static-protective package containing the DIMM to any unpainted metal surface on the engine. Then, remove the DIMM from the package.

Note: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

4. Installing the new DIMM:
 - a. Turn the DIMM so that the pins align correctly with the connector.
 - b. Insert the DIMM into the connector by pressing on one edge of the DIMM and then on the other edge of the DIMM. Be sure to press straight into the connector. Be sure that the retaining clips snap into the closed positions.
 - c. Make sure that the retaining clips are in the closed position. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

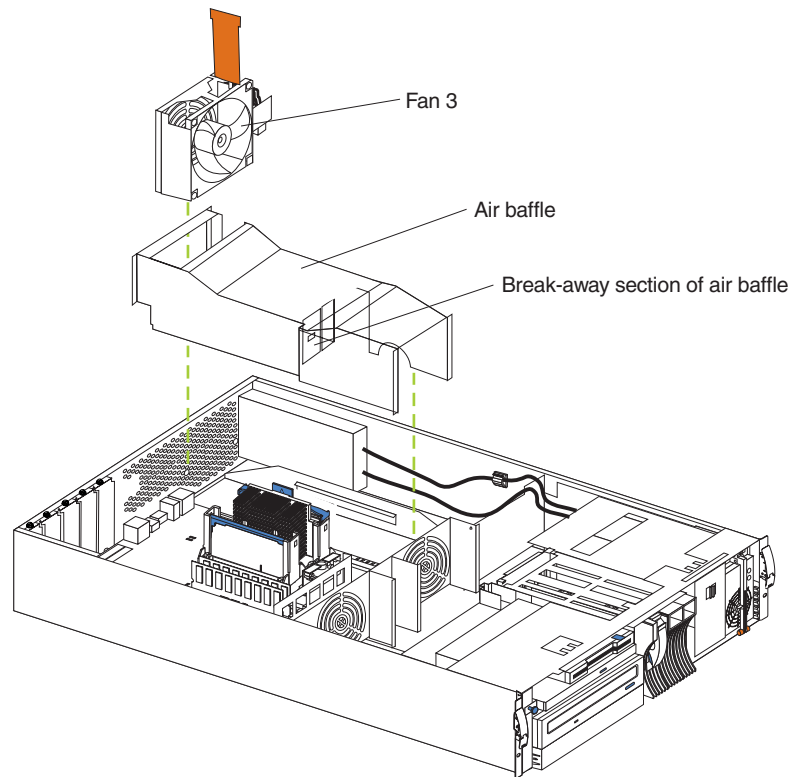
Replacing microprocessors

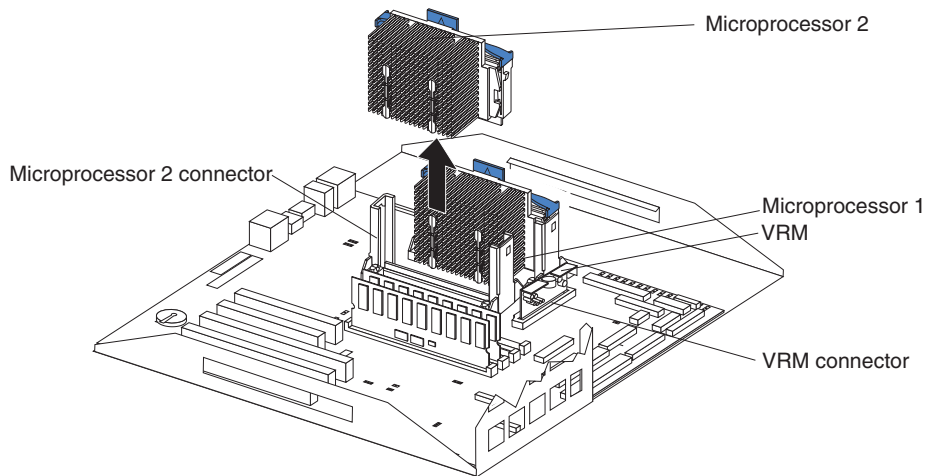
Each IBM NAS 300 engine comes with two microprocessors installed on the system board.

Note: Before you replace a defective microprocessor, review the documentation that comes with the microprocessor, so that you can determine whether you need to update the engine basic input/output system (BIOS). The latest level of BIOS for your engine is available through the Web at www.storage.ibm.com/support/nas.

Attention: To avoid damage and ensure proper engine operation when you install a new microprocessor, use microprocessors that have the same cache size and type, and the same clock speed.

Note: The illustrations in this document might differ slightly from your hardware.





To replace a microprocessor, perform the following steps:

Attention: When you handle Electrostatic Discharge-Sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 108.

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105.
2. Power off the engine and peripheral devices and disconnect all external cables and power cords; then, remove the cover (see “Removing the cover and bezel” on page 32).
3. Remove the fan 3 assembly by lifting the orange handle on top of the fan assembly and lifting out the fan assembly.
4. Remove the air baffle by grasping it at the sides and lifting it out.
5. Remove the defective microprocessor by pulling upward on the microprocessor handle and lifting it out.
6. Install the new microprocessor:
 - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the engine, then remove the microprocessor from the package.
 - b. Center the microprocessor over the microprocessor connector and carefully press the microprocessor into the connector.
7. Install the air baffle. Make sure that the sides of the air baffle fit inside the brackets on the engine.
8. Install the fan 3 assembly.
9. If you have other options to install or remove, do so now; otherwise, go to “Installing the cover and bezel” on page 46.

Replacing power supplies

Each IBM NAS 300 engine comes with two power supplies, which are hot-swappable.

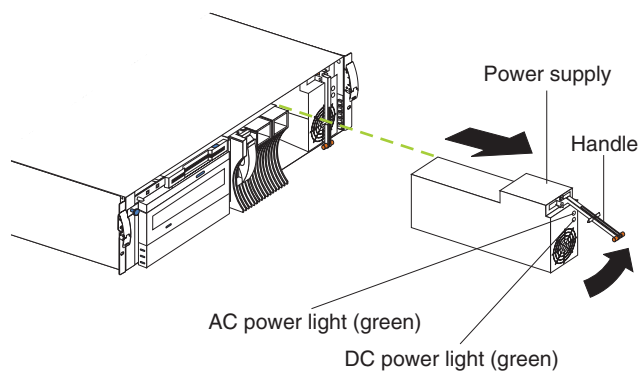


CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

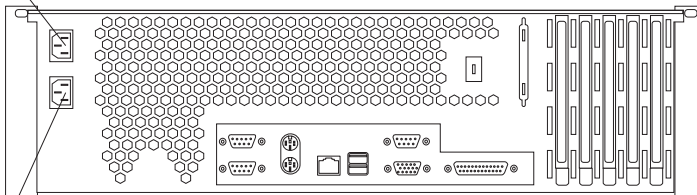


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.



Power supply 1 power cord connector



Power supply 2 power cord connector

1. Remove the bezel. See “Removing the cover and bezel” on page 32.
2. Unplug the power cord for the power supply you want to replace from the electrical outlet.
3. Unplug the power cord from the back of the engine.
4. Lift up the power supply handle and gently slide the power supply out of the chassis.

Note: During normal operation, each power-supply bay must have a power supply installed for proper cooling.

5. Install the new power supply in the bay:
 - a. Place the handle on the power supply in the open position and slide the power supply into the chassis.
 - b. Gently close the handle to seat the power supply in the bay.

6. Re-plug the power cord for the new power supply into the power cord connector on the rear of the engine.
7. Re-plug the power cord into a properly grounded electrical outlet.
8. Verify that the DC Power light and AC Power light on the power supply are lit, indicating that the power supply is operating correctly.
9. Replace the bezel. (See “Installing the cover and bezel” on page 46.)

Installing and cabling the optional Advanced System Management (ASM) PCI adapter

Each engine comes standard with a communication port dedicated to the Advanced System Management (ASM) Processor to allow you to manage the engine at anytime from virtually anywhere. The optional ASM PCI adapter allows you to connect via LAN or modem from virtually anywhere for extensive remote management. The ASM PCI adapter works in conjunction with the ASM processor that is integrated into the base planar board of each of the two engines (an interconnect cable that connects both engines to the ASM PCI adapter). The ASM PCI adapter enables management through a Web browser interface, in addition to ANSI terminal, Telnet, and Netfinity Director. The adapter installation and cabling sequence follows:

Use an ASM PCI adapter that is connected to your ASM Interconnect bus as an Ethernet gateway for your ASM Interconnect bus, enabling all ASM information generated by engines attached to the ASM Interconnect bus to be forwarded to other systems on your Ethernet network.

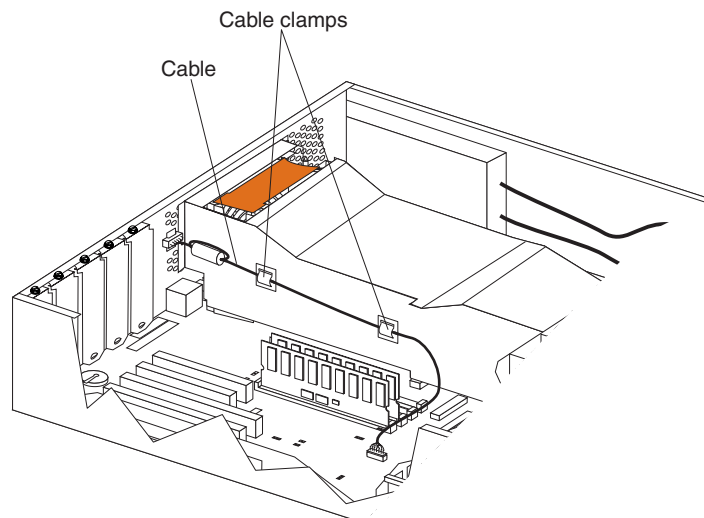
The ASM PCI adapter installation and cabling sequence follows:

1. Review the information in “Before you begin” on page 29 and in “Appendix I. Safety and environmental notices” on page 105.
2. Power-off the engine; and disconnect all external cables and power cords
3. Remove the top cover.

Cabling the ASM interconnect (internal) cable:

1. Route the Advanced System Management Interconnect option cable as shown in the following illustration.

Note: The illustrations in this document might differ slightly from your hardware.



Installing the ASM PCI adapter:

1. Remove the expansion-slot cover as shown in the following illustration:

- a. Loosen and remove the screw on the top of the expansion-slot cover.

Note: The ASM adapter should be installed in PCI slot 1. For more information on PCI-adapter slot locations, see “Appendix B. PCI Adapter Placement” on page 77.

- b. Slide the expansion-slot cover out of the engine. Store it in a safe place for future use.

Attention: Expansion-slot covers must be installed on the openings for all vacant slots. This maintains the electromagnetic emissions characteristics of the system and ensures proper cooling of system components.

2. Remove the adapter from the static-protective package.

Attention: Avoid touching the components and gold-edge connectors on the adapter.

3. Place the adapter, component-side up, on a flat, static-protective surface.

4. Install the adapter:

- a. Carefully grasp the adapter by its top edge or upper corners, and align it with the expansion slot on the system board.

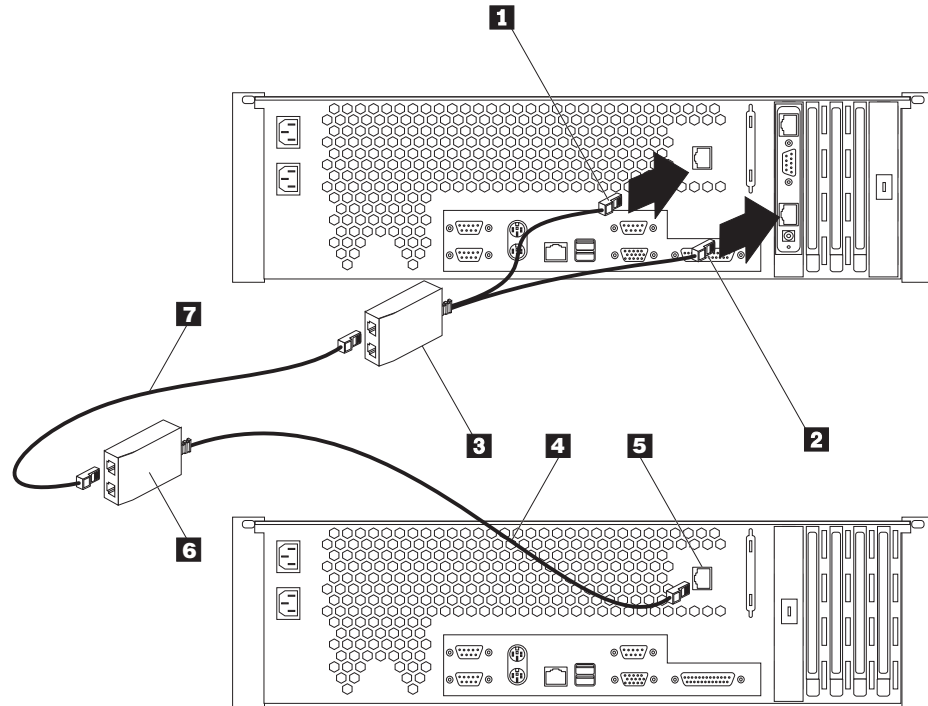
- b. Press the adapter *firmly* into the expansion slot.

Attention: When you install an adapter in the engine, ensure that it is completely and correctly seated in the system-board connector before you apply power. Incomplete insertion might cause damage to the system board or the adapter.

- c. Insert and tighten the expansion-slot screw on the top of the adapter bracket.

Cabling the ASM interconnect (external) cable:

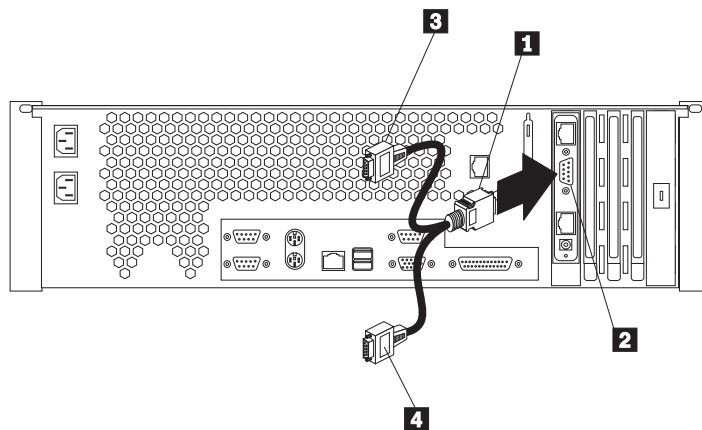
1. Connect the RJ-11 connector **1** on the ASM interconnect cable to the connector on the back of the engine as shown in the following illustration:.



2. Connect the other RJ-11 connector **2** on the ASM interconnect cable to the lower connector on the ASM adapter.
3. For each engine you want to manage with the ASM adapter, connect an ASM interconnect cable **4** to **5**, then connect **3** to **6** to the next engine, using the 6-ft. Ethernet cable **7** provided.

Connecting a serial cable: If you want to manage your engine remotely, you need to install the serial cable to connect a modem. Connect the serial cable to the ASM PCI adapter as shown in the following illustration:

1. Connect the serial connector on the serial cable **1** to the serial port on the ASM adapter **2**.

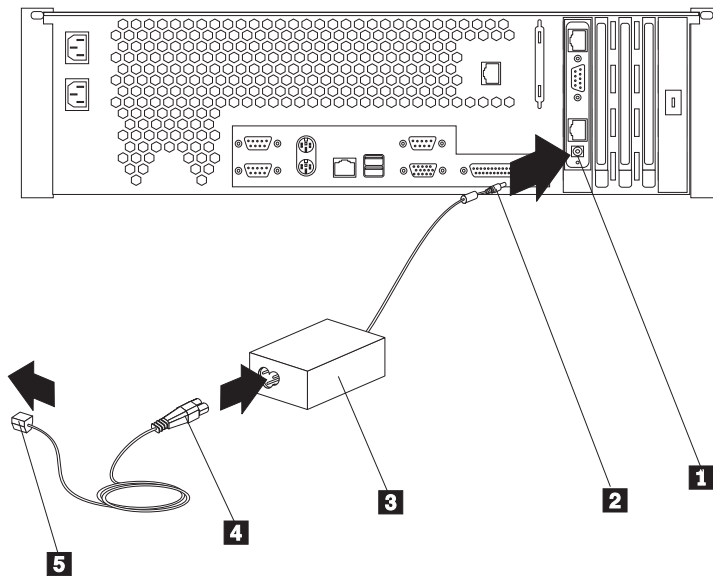


2. Connect either of the two serial connectors **3** or **4** to the device you want to connect the ASM adapter to.

Note: Each of the two serial connectors is labeled to help you determine which connector to use for a particular device. One connector is labeled “MODEM” and the other is labeled “COM_AUX”.

Completing the installation: To complete the installation of the ASM PCI adapter, do the following:

1. Reinstall the cover on the engine
2. Install the power unit adapter **3** by connecting the power unit control cable **2** to the connector on the ASM PCI adapter **1**.



3. Connect the power unit power cord **4** to the connector on the power unit adapter **3**.
4. Connect the system power cord **5** to an electrical outlet.
5. Complete your installation by powering on the engine and running the power-on diagnostics. Each time the engine is powered-on, it automatically runs a self-testing program to ensure that the hardware is running correctly. If power-on diagnostics complete successfully, the information light and the system error light is off.

If a problem is detected refer to the *TotalStorage Network Attached Storage 300 User's Reference* for troubleshooting procedures.

6. Configure your ASM PCI adapter; go to “Configuring the ASM PCI adapter”.

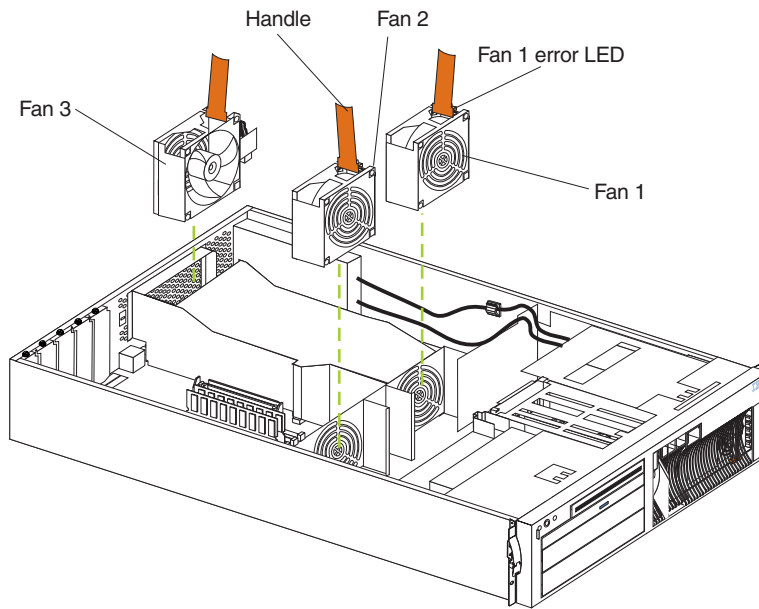
Configuring the ASM PCI adapter: Before you can remotely monitor your engine, you must configure your ASM PCI adapter. Configuration is described in the *TotalStorage Network Attached Storage 300 User's Reference*.

Replacing a fan assembly

Each IBM NAS 300 engine comes with three hot-swap fan assemblies. You do not need to power off the engine to replace a hot-swap fan assembly.

Attention: Replace a fan that has failed within 48 hours to help ensure proper cooling.

Note: The illustrations in this document might differ slightly from your hardware.

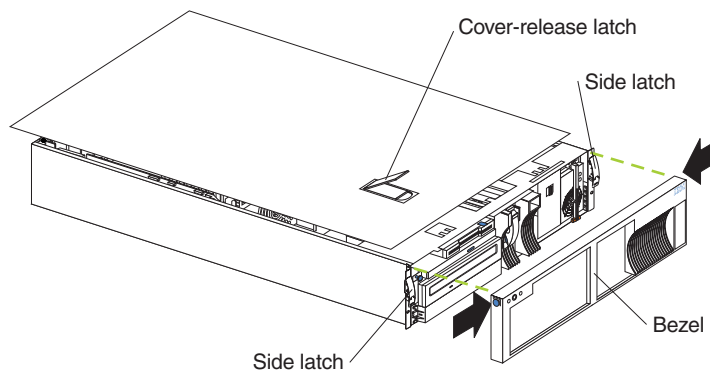


To replace a fan assembly:

1. Remove the cover. See “Removing the cover and bezel” on page 32.
Attention: To ensure proper system cooling, do not remove the top cover for more than 30 minutes during this procedure.
2. The LED on the failing fan assembly will be lit. Remove the failing fan assembly from the engine by lifting the orange handle on the top of the fan assembly and pulling the fan assembly out.
3. Slide the replacement fan assembly into the engine until it clicks into place.
4. Verify that the FAN LED on the diagnostics panel on the system board is not lit. If the FAN LED is lit, reseal the fan.
5. Replace the cover. See “Installing the cover and bezel”.

Installing the cover and bezel

Note: The illustrations in this document might differ slightly from your hardware.



To install the IBM NAS 300 engine cover:

1. Place the cover-release latch in the open (up) position and align the flanges on the left and right sides of the cover with the slots on the engine chassis.
2. Close the cover-release latch.

To install the bezel:

1. Align the trim bezel with the front of the engine.
2. Press inward on the top sides of the bezel and press the bezel toward the engine until it clicks into place.

To complete the installation:

If you disconnected any cables from the back of the engine, reconnect the cables; then, plug the power cords into properly grounded electrical outlets.

Replacing the entire engine

Replacing a rack-mounted engine is similar to replacing a Fibre Channel hub. See “Working with the Fibre Channel hub” on page 72 for the steps to replace a rack-mounted IBM NAS 300 component.

Installing and replacing RAID storage controller components

This section provides instructions to help you install or remove CRUs, such as hot-swap disk drives, fans, RAID controllers, and power supplies.

Handling static-sensitive devices

Attention: Static electricity can damage storage server components or options. To avoid damage, keep static sensitive devices in their static protective bag until you are ready to install them.

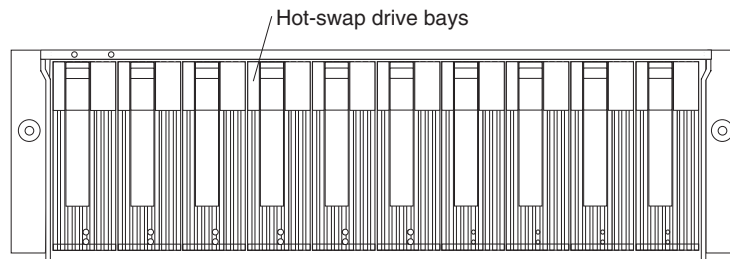
To reduce the possibility of electrostatic discharge (ESD) when you handle options and storage server components, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the storage server for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your storage server without setting it down. If it is necessary to set the device down, place it on its static-protective package. Do not place the device on your storage server cover or any metal surface.
- Take additional care when handling devices during cold weather as heating reduces indoor humidity and increases static electricity.

Working with hot-swap drives

Drives are devices that the system uses to store and retrieve data. This section explains how you can replace a defective drive.

The following illustration shows the location of the hot-swap drive bays that are accessible from the front of the RAID storage controller.



Attention: Never hot-swap a drive CRU when its green Activity LED is flashing. Hot-swap a drive CRU only when its amber Fault LED is completely on and not flashing, or when the drive is inactive with the green Activity LED on and not flashing.

Before you install or remove drive CRUs, review the following information:

Drive CRUs

Each RAID storage controller contains 10 slim 40-pin Fibre Channel hard disk drives. These drives come preinstalled in drive trays. This drive-and-tray assembly is called a *drive CRU*.

Drive LEDs

Each drive CRU has two LEDs, which indicate the status for that particular drive. For information about the drive LED operating states and descriptions, see the *User's Reference*.

Fibre Channel loop IDs

When you replace a drive CRU in the RAID storage controller, the drive CRU connects into a printed circuit board called the *midplane*. The midplane sets the Fibre Channel loop ID automatically, based on the setting of the tray number switch and the physical location (bay) of the drive CRU.

Hot-swap hardware

The RAID storage controller contains hardware that you can use to replace a failed hard disk drive without turning off the RAID storage controller. Therefore, you can continue operating the system while a hard disk drive is removed or installed. These drives are known as *hot-swap* drives.

Slim drives

Hot-swap drive CRUs that are slightly smaller than the standard disk drive. These drive CRUs do not fill the entire drive bay. To maintain proper airflow and cooling, you must use a slim filler piece with each slim drive.

Replacing hot-swap drives

Drive problems include any malfunctions that delay, interrupt, or prevent successful I/O activity between the hosts and the hard disk drives. This section explains how to replace a failed drive.

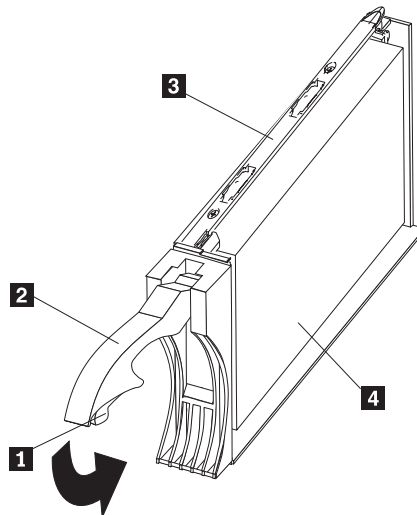
Attention: Failure to replace the drives in their correct bays might result in loss of data. If you are replacing a drive that is part of a RAID level 1 or RAID level 5 logical drive, ensure that you install the replacement drive in the correct bay.

Use the following procedure to replace host-swap drives:

1. Check the hardware and software documentation that is provided with the system to see if there are restrictions regarding hard disk drive configurations. Some system Fibre Channel configurations might not allow mixing different drive capacities or types within an array.
2. Check the storage-management software for recovery procedures for a drive that has failed. Follow the steps in the software procedure before continuing with this procedure.
3. Determine the location of the drive that you want to remove.

Attention: Never hot-swap a drive CRU when its green Activity LED is flashing. Hot-swap a drive CRU only when its amber Drive fault LED is on and not flashing, or when the drive is inactive with the green Activity LED on and not flashing.

4. Remove the drive CRU.
 - a. Press on the inside of the bottom of the tray handle to release the blue latch **1**.
 - b. Pull the handle **2** on the tray **3** out into the open position.
 - c. Lift the drive CRU partially out of the bay.
 - d. To avoid possible damage to the drive **4**, wait at least 20 seconds before fully removing the drive CRU from the RAID storage controller to allow for the drive to spin down.



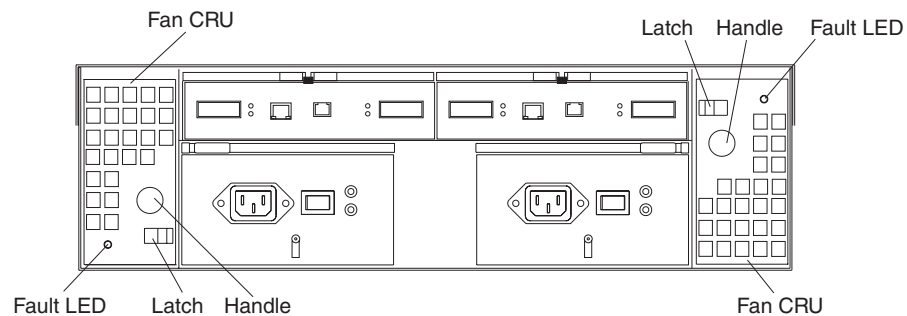
- e. Verify that there is proper identification (such as a label) on the drive CRU, and then slide it completely out of the RAID storage controller.
 - f. If you are replacing a slim drive, ensure that the filler piece remains in place for use with the new drive.
5. Install the new drive CRU.
 - a. Gently push the drive CRU into the empty bay until the tray handle **2** touches the storage-server bezel.
 - b. Push the tray handle **2** down into the closed (latched) position.
6. Check the drive LEDs.
 - a. When a drive is ready for use, the green Activity LED is on, and the amber Drive fault LED is off.
 - b. If the amber Drive fault LED is on and not flashing, remove the drive from the unit and wait 10 seconds; then, reinstall the drive.
7. Return to normal operation.

Working with hot-swap cooling fans

The RAID storage controller cooling system consists of two fan CRUs, each containing two fans. The fan CRUs circulate air inside the unit by pulling in air through the vents on the front of the drive CRUs and pushing out air through the vents in the back of each fan CRU.

If two fans fail, or the fans cannot maintain an internal temperature below 70°C (158°F), the power supplies in the unit will automatically shut down (an overtemperature condition). If this occurs, you must cool the unit and restart it. Refer to the *User's Reference*.

Attention: The fans in the storage server draw in fresh air and force out hot air. These fans are hot-swappable and redundant; however, when one fan fails, the fan CRU must be replaced within 48 hours to maintain redundancy and optimum cooling. When you replace the failed fan CRU, be sure to install the second fan CRU within 10 minutes to prevent any overheating due to the lack of the additional fan CRU.



Fan CRUs

The two fan CRUs are hot-swappable and redundant.

Fault LEDs

These amber LEDs light when a fan failure occurs.

Latches and handles

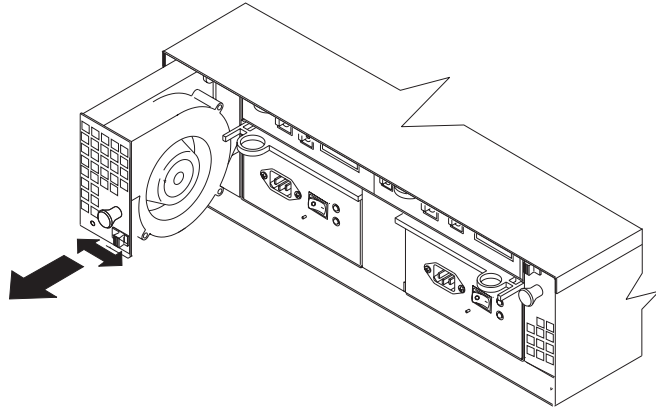
Use the latches and handles to remove or install the fan CRUs.

Attention: Do not run the RAID storage controller without adequate ventilation and cooling, because it might cause damage to the internal components and circuitry.

Both fan units must always be in place, even if one is not functioning properly, to maintain proper cooling.

Use the following procedure to replace a hot-swap fan:

1. Check the LEDs on the back of the storage server.
2. If the amber Fault LED is on, remove the fan CRU that has failed.
 - a. Slide the latch to unlock the fan CRU.
 - b. Use the handle (black knob) to pull the fan from the storage server.



3. Install the new fan unit.
 - a. Place the fan CRU in front of the fan slot.
 - b. Hold the latch open, and slide the fan all the way into the slot. If the fan does not go into the bay, rotate it 180°. Ensure that the latch is on the side closest to the center of the storage server.
 - c. Release the latch. If the lever remains open, pull back on the fan slightly, and then push it in again until the latch snaps into place.
4. Check the LEDs.

The Fault LEDs turn off after a few seconds; if they remain on, refer to the *User's Reference* .

Working with hot-swap power supplies

The RAID storage controller power system consists of two power supply CRUs. The power supply CRUs provide power to the internal components by converting incoming ac voltage to dc voltage. One power supply CRU can maintain electrical power to the unit if the other power supply is turned off or malfunctions. The power supply CRUs are interchangeable (by reversing the locking levers).

Each power supply CRU has a built-in sensor that detects the following conditions:

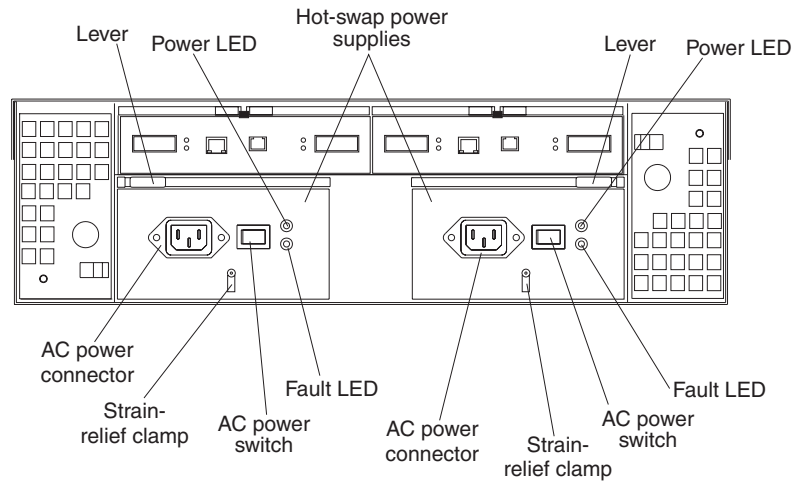
- Over-voltage
- Over-current
- Overheated power supply

If any of these conditions occurs, one or both power supplies will shut down. All power remains off until you cycle the power switches (turn the power switches off, wait at least 30 seconds, then turn the power switches ON). For more information, see the *User's Reference*.

The power supplies are CRUs and do not require preventive maintenance.

- Always keep the power supplies in their proper places to maintain proper controller-unit cooling.
- Use only the supported power supplies for your specific storage server.

The power-supply controls on the rear of the storage server are shown in the following illustration.



Levers

Use these locking handles to remove or install a power supply.

Power LED

These green LEDs light when the storage server is turned on and receiving ac power.

Fault LEDs

These amber LEDs light if a power supply failure occurs or if the power supply is turned off.

AC power switches

Use these switches to turn the power supplies on and off. You must turn on both switches to take advantage of the redundant power supplies.

AC power connectors

This is the connection for the ac power cord.

Strain-relief clamp

Use this clamp to provide strain relief on the power cord.

Removing a hot-swap power supply

Statement 8



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.

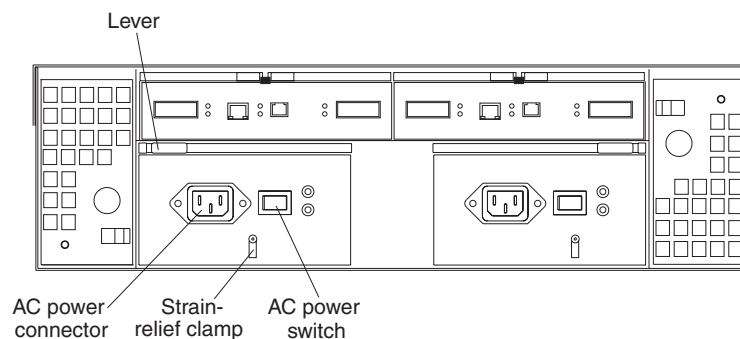


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

To remove a hot-swap power supply:

1. Turn off the ac power switch.

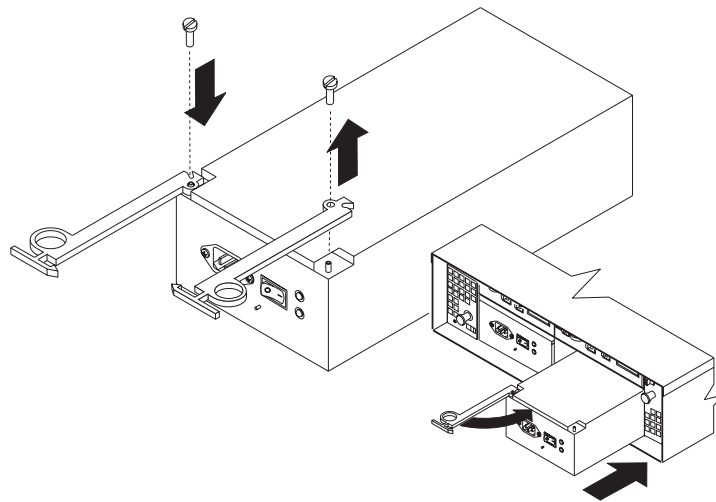


2. Unplug the power cord from the electrical outlet.
3. Disconnect the power cord from the ac power connector on the power supply.
4. Remove the nut and strain-relief clamp from the rear of the power supply.
5. Remove the power supply from the RAID storage controller, as follows:
 - a. Grasp the pull-ring on the power-supply lever, and squeeze the latch to release it.
 - b. Pull the lever open and remove the power supply.

Installing a hot-swap power supply

Note: When replacing a power supply that has failed, ensure that the power supply latch is mounted on the side of the power supply that faces the middle of the storage server. If it is not, remove the lever screw, flip the lever over, and

tighten the screw on the opposite side.



To install a hot-swap power supply:

Statement 8



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.

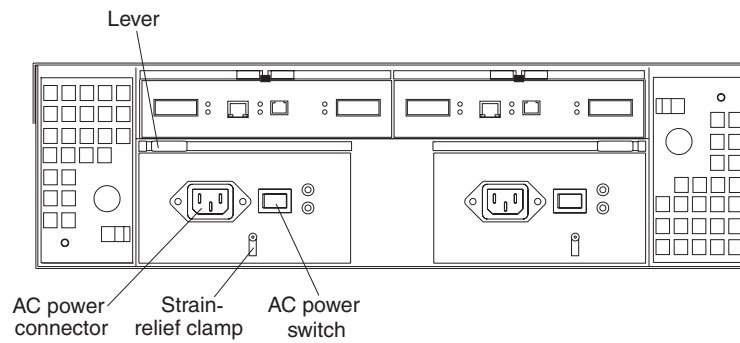


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

1. Ensure that the ac power switch is off on the power supply that you are installing.
2. Install the power supply in the RAID storage controller, as follows:
 - a. Slide the power supply into the RAID storage controller. Make sure that the lever is pulled straight out as you slide the power supply into the storage server.
 - b. Close the lever until the pull-ring latch locks in place. Make sure that the lever locks into place.
3. Wrap the strain-relief clamp around the power cord approximately 20 cm (8 in.) from the power-supply connection end.
4. Attach the power-supply nut, and tighten it securely.

5. Connect the power cord to the ac power connector.



6. Plug the power cord into a properly grounded electrical outlet.
7. Turn ON the power-supply switch.
8. Make sure that the green Power LED on the new power-supply CRU is on and the amber Fault LED is off.
 - If the Power LED is off, the power-supply CRU might not be installed correctly. Remove it and then reinstall it.
 - If the Fault LED is on or the Power LED stays off, refer to the storage-management software for problem determination.

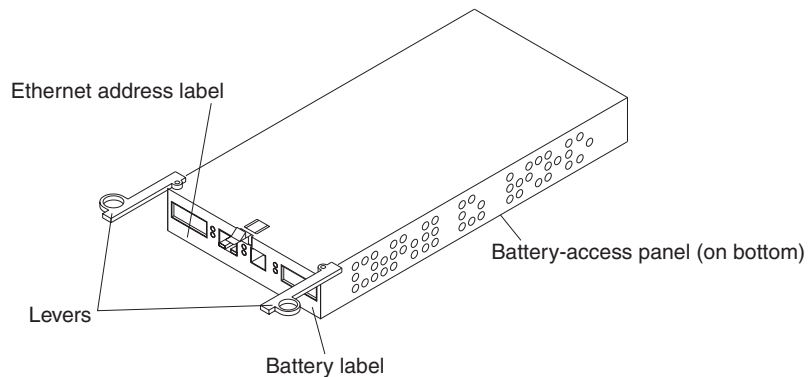
For more information about the LEDs, see the *User's Reference*.

Working with hot-swap RAID controllers

Each RAID controller fits into the back of the RAID storage controller and has the following components:

- Battery
- Cache memory
- One host port and one expansion port
- One Ethernet port
- One RS-232 port

Each RAID controller has a unique hardware Ethernet address, which is printed on a label on the front. There is also a label giving the installation and expiration date of the battery. The following illustration shows the location of these items.



Replacing a RAID controller

When instructed to do so by the storage-management software, replace a RAID controller that has failed.

Note: The replacement RAID controller CRU does not come with a RAID controller cache battery installed. You must remove the cache battery that is inside the existing RAID controller that you are replacing, and install that battery inside the replacement RAID controller CRU. The steps to remove and replace the battery are included in the following procedure.

To remove a RAID controller, do the following:

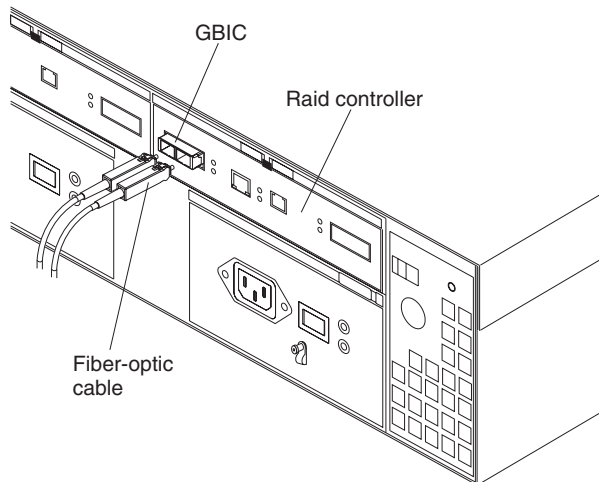
1. Check the storage-management software for instructions on RAID controller failure-recovery procedures. Follow the steps provided in the software documentation before continuing with step 2.
2. If you have redundant RAID controllers (dual-controller configuration), use the storage-management software to take the RAID controller that has failed offline.

Attention: To prevent data loss if you have a single controller configuration, you must shut down your system before you can replace the RAID controller. For the proper shutdown sequence, see “Powering off the IBM NAS 300” on page 25.

3. Label each cable that connects to the RAID controller that has failed. This ensures that all cables will be properly reconnected to the new RAID controller.

Attention: Handle and install fiber optic cables properly to avoid degraded performance or loss of communications with devices. When working with fiber optic cables, do not pinch them, step on them, or locate them in aisles or walkways. Do not overtighten the cable straps or bend the cables to a radius smaller than 76 mm (3 in.).

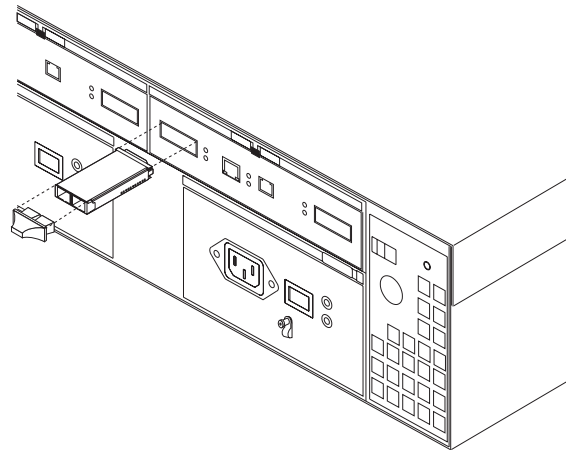
4. From the RAID controller that has failed, remove the Fibre Channel cables from the GBICs. The location of these components is shown in the following illustration.



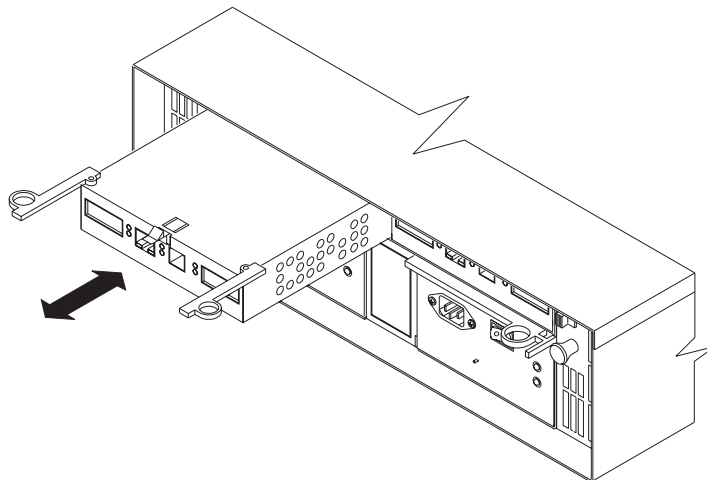
After removing the Fibre Channel cables, insert the protective caps.

5. Use the following procedure to remove the GBICs from the RAID controller that has failed.

- a. Move the metal latch on the GBIC to the unlocked (center) position.



- b. Pull the GBIC out of the port.
 - c. Insert the protective cap on the GBIC.
6. Remove the failed RAID controller (the Fault LED is on), as follows:
 - a. Push down on the latch (centered above the RAID controller). The levers pop out of the locked position.



- b. Grasp the pull-rings; then, pull on the levers and remove the RAID controller.

To install a new RAID controller, perform the following steps:

1. Unpack the new RAID controller.
Set the RAID controller on a dry, level surface away from magnetic fields. Save the packing material and documentation in case you need to return the RAID controller.
2. Using a Phillips head screwdriver, remove the eight screws from the battery access panel on the bottom of the replacement RAID controller CRU.
3. Connect the battery harness on the battery to the two-pin connector on the controller board.
4. Position the battery inside the replacement RAID controller, and replace the battery-access panel.

5. Copy the battery replacement information from the label on the front of the failed RAID controller to the label on the front of the replacement RAID controller CRU.
 6. Install the new RAID controller, as follows:
 - a. Slide the RAID controller all the way into the empty slot.
 - b. Close both levers until the latch locks into place.
- Attention:** When you replace the failed RAID controller, the storage-management software automatically synchronizes the firmware between the existing controller and the new controller. After replacing a controller, always use the storage-management software to verify the firmware levels and NVSRAM files.
7. Insert the GBICs according to the instructions in “Installing GBICs” on page 19.
 8. Connect the Fibre Channel cables to their original locations, according to the instructions in “Installing fiber-optic cables” on page 21.
 9. If you have a single-controller configuration, turn ON power to the storage server and attached devices. For the proper power-on sequence, see “Powering on the IBM NAS 300” on page 25.
 10. Wait approximately one minute, and then check the green Host Loop LED, green Expansion Loop LED, and amber Fault LED on the new RAID controller.
 - If the Host Loop LED or the Expansion Loop LED is off, the RAID controller might not be inserted correctly. Remove the CRU and reinsert it.
 - If the Fault LED is on, the Host Loop LED and the Expansion Loop LED stay off, or any other Fault LED is on, refer to the storage-management software for problem determination.
 11. Refer to the storage-management software online help for instructions on bringing the controller online.

Replacing the battery in the RAID controller

Each RAID controller contains a rechargeable battery that maintains the data in the cache memory.

Use the following procedure if the storage-management software instructs you to replace the battery because the current battery has failed or is nearing its expiration date.

1. Check the storage-management software for instructions on battery replacement procedures. If you are not using write-cache mirroring, this might involve clearing cache memory on the RAID controller that contains the battery that has failed. Follow the steps given in the software procedure before continuing with this procedure.

Attention: When you handle electrostatic discharge (ESD) sensitive devices, take precautions to avoid damage from static electricity. For details about handling ESD-sensitive devices, see “Handling static-sensitive devices” on page 47.

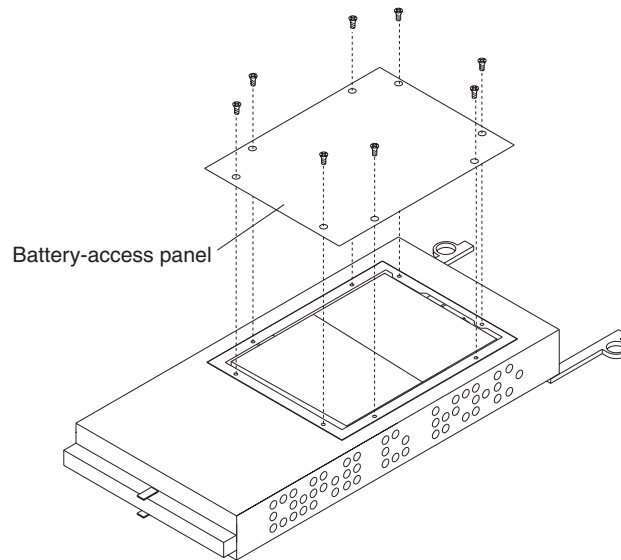
2. Unpack the new battery.

Set the new battery on a dry, level surface. Save all packing materials in case you need to return the battery.

Note: The battery comes with a new battery label. You will need this label later in the procedure.

3. Review all documentation that comes with the new battery for updated replacement procedures and other information.

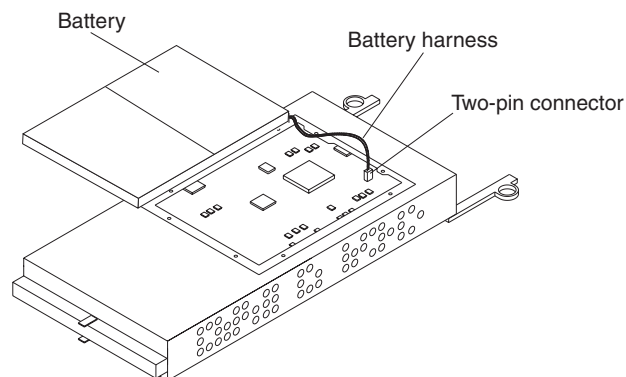
4. Use the storage-management software to locate the RAID controller containing the failed battery (the RAID controller Fault LED might be on).
5. Label each cable that connects to the RAID controller that contains the battery that has failed. This ensures that all cables will be properly reconnected to the RAID controller after you replace the battery.
6. Use the storage-management software to take the RAID controller offline that contains the battery that has failed.
7. From the RAID controller that contains the battery that has failed, remove the Fibre Channel cables and then the GBICs. For more information, see “Working with GBICs and fiber-optic cables” on page 19.
8. Remove the RAID controller as described in “Replacing a RAID controller” on page 55.
9. Using a Phillips head screwdriver, remove the eight screws from the battery access panel on the bottom of the RAID controller CRU, as shown in the following illustration.



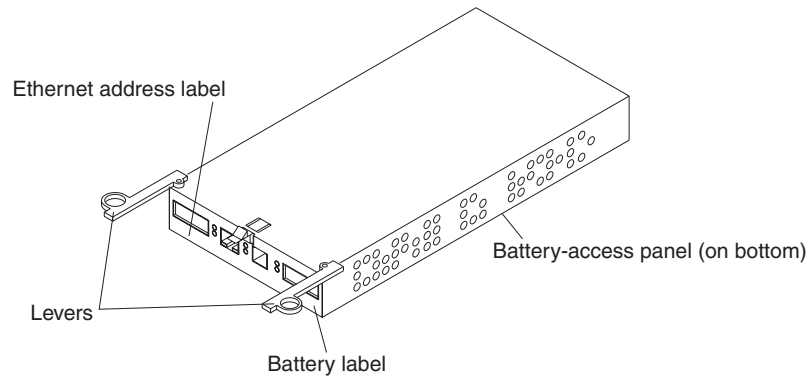
10. Lift the old battery out of the RAID controller CRU.

Note: If you cannot lift out the battery, turn over the RAID controller holding it upside-down close above a flat surface and let it fall out. Do not let the weight of the battery pull on the battery harness.

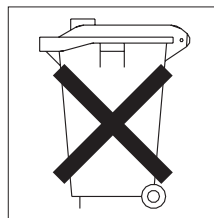
11. Disconnect the battery harness on the old battery from the two-pin connector on the controller board, and remove the battery, as shown in the following illustration.



12. Connect the battery harness on the new battery to the two-pin connector on the controller board.
13. Position the battery inside the RAID controller, and replace the battery-access panel.
14. Put the new battery label on the front of the RAID controller, over the old battery label. The location of the battery label is shown in the following illustration.



15. Write the battery replacement information on the label on the front of the new RAID controller CRU.
 - Date of Installation – Write today's date
 - Replacement Date – Write the date three years from now



CONTAINS
SEALED LEAD
BATTERY.
BATTERY
MUST BE
RECYCLED.

Pb

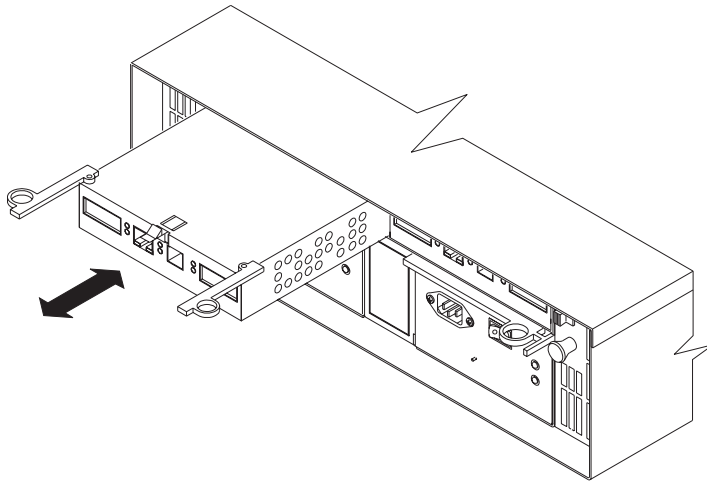
CAUTION:

Use proper facilities to recycle the used battery CRU. If the battery CRU is physically damaged or leaking electrolyte gel, *do not* ship it to a recycling center. The battery contains sealed lead-acid batteries that might be considered hazardous material. You must handle this unit in accordance with all applicable local and federal regulations.

For safety notice translations, see "Appendix I. Safety and environmental notices" on page 105.

16. Dispose of the used battery CRU according to local and federal regulations, which might include hazardous material handling procedures.

17. Install the RAID controller, as shown in the following illustration.



- a. Slide the RAID controller all the way into the empty slot.
 - b. Close both levers until the latch locks into place.
18. Install the GBICs and then connect the Fibre Channel cables to their original locations.
 19. If you have a single-controller configuration, turn ON power to the storage server and attached devices. For the proper power-on sequence, see “Powering on the IBM NAS 300” on page 25.
 20. Wait approximately one minute, and then check the green Host Loop LED, the green Expansion Loop LED, and the amber Fault LED on the new RAID controller.
 - If the Host Loop LED or the Expansion Loop LED is off, the RAID controller might not be inserted correctly. Remove the RAID controller and reinsert it.
 - If the Fault LED is on, the Host Loop LED and Expansion Loop LED stay off, or any other Fault LED is on, refer to the storage-management software for problem determination.
 21. Refer to the storage-management software online help for instructions on bringing the controller online and resetting the battery age.

Note: There are two cache batteries in the unit (one for each controller). Make sure that you reset the age for the correct battery. Also, you might get a software message indicating that the new battery has failed or is nearing its expiration date. This message will disappear after you reset the battery age through the software and battery charging is completed.

Installing GBICs and fiber optic cables

Each RAID controller unit has one host port and one expansion unit port. Gigabit Interface Converters (GBICs) are inserted into the ports, and then Fibre Channel cables are connected to the GBICs. This section provides information on installing GBICs. The GBICs are laser products.

Statement 3



Statement 3

CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



Danger

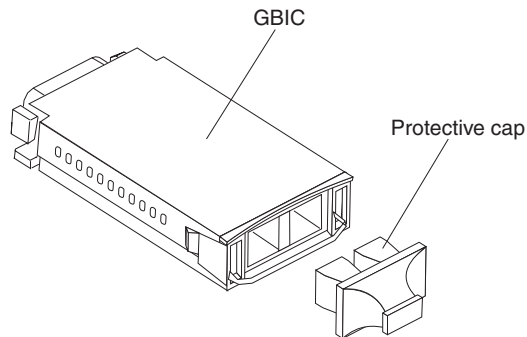
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Note: For safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

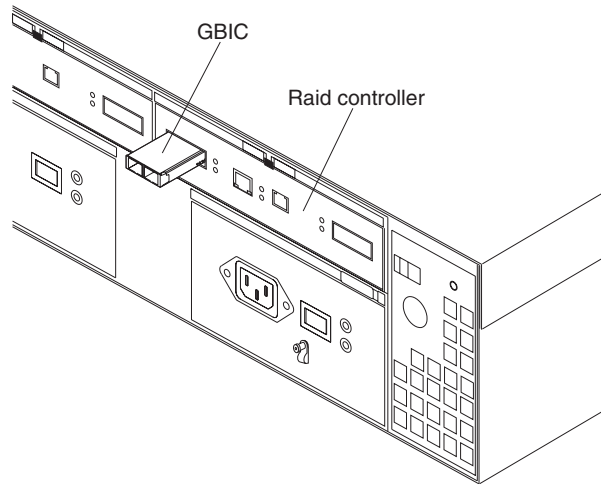
To install a GBIC, perform the following steps:

1. Remove the protective cap from the GBIC, as shown in the following illustration.

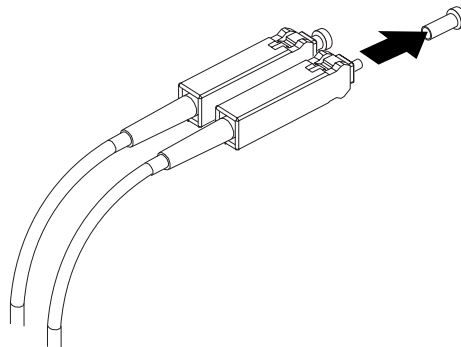


2. If the GBIC that you are installing has a metal latch, move the latch to the unlocked (center) position.

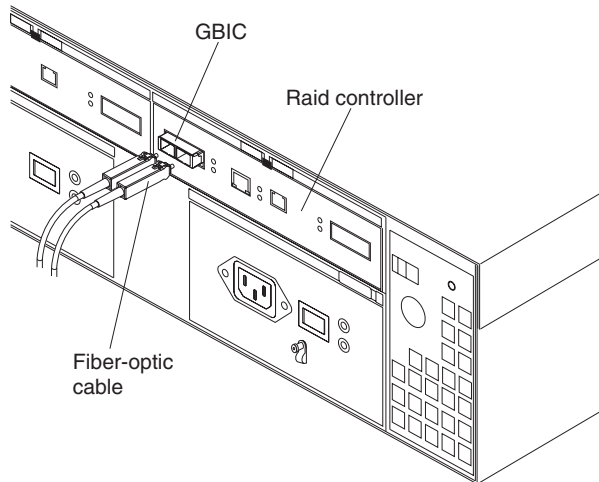
3. Insert the GBIC into the host or expansion port on the RAID controller, as shown in the following illustration.



4. After the GBIC is inserted all the way into the port, rotate the GBIC latch outward to the locked position (flush with the rear of the GBIC).
5. Move the GBIC latch to the unlocked (center) position.
6. Insert the GBIC into the GBIC port on the RAID controller.
7. Move the GBIC latch back to the locked position (flush with the rear of the GBIC).
8. Remove the protective caps from the fiber optic cable.



9. Connect the fiber optic cable to the installed GBIC, as shown in the following illustration.



Note: The fiber optic cable connection is keyed for proper insertion.

Installing and replacing storage unit components

This section provides instructions to help you install or remove CRUs, such as hot-swap drives, fans, ESM boards, and power supplies. This chapter also contains instructions for turning the storage unit on and off.

Handling static-sensitive devices

Static electricity, though harmless to you, can seriously damage storage unit components or options.

Note: When you are adding an internal option, do not open the static-protective package containing the option until you are instructed to do so.

When you handle options and other storage unit components, take these precautions to avoid damage from static electricity:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Never touch any exposed circuitry.
- Prevent others from touching components.
- When you are installing a new option, touch the static-protective package containing the option to a metal expansion-slot screw or other unpainted metal surface on the storage unit for at least two seconds. (This reduces static electricity from the package and from your body.)
- When possible, remove the option and install it directly into the storage unit without setting the option down. When this is not possible, place the static-protective package that the option comes in on a smooth, level surface and place the option on it.
- Do not place the option on the storage unit's covers or any metal surface.
- When possible, wear an electro-static discharge (ESD) protective ground strap.

Working with hot-swap drives

Before you begin

- Read the safety and handling guidelines provided in “Appendix I. Safety and environmental notices” on page 105 and “Handling static-sensitive devices” on page 64.
- Ensure that your current system configuration is working properly.
- Back up all important data before you make changes to storage devices, such as hard disk drives.

This section explains how you can replace a defective drive.

Before you remove drive CRUs, review the following information:

- **Drive CRUs:** Your storage unit supports IBM Fibre Channel (FC) hard disk drives. These IBM drives come preinstalled in a drive tray, ready for installation. (Do not detach the drive from the tray.) This drive and tray assembly is called a *drive CRU*.
- **Drive CRU labels:** A label is provided on the front of the drive CRU tray. Use this label to record the location information for each drive *before* you remove it. Ensure that you keep track of the drives and their corresponding bays.
Attention: If you reinstall a drive in the wrong bay, you might lose data.
- **Drive LEDs:** Each drive tray has two LEDs, which indicate the status for that particular drive. The drive LED states and descriptions are as follows.

LED	LED State	Definitions
Activity LED	Green flashing	The green light flashes to indicate FC activity to the drive.
Activity LED	Green on	The green light is on to indicate the drive is properly installed.
Fault LED	Amber flashing	The amber light flashes to indicate a drive rebuild is under way, or that a drive has been identified by software.
Fault LED	Amber on	The amber light is on to indicate a drive failure.

- **Fibre Channel loop IDs:**

When you replace a drive CRU in the storage unit, the drive tray plugs into a printed circuit board called the *midplane*. The midplane sets the Fibre Channel loop ID automatically, based on the setting of the tray number switch and the physical location (bay) of the drive CRU.

- **Hot-swap hardware:** Your storage unit contains hardware that enables you to replace a failed hard disk drive without turning off the storage unit. Therefore, you have the advantage of continuing to operate your system while a hard disk drive is removed.
- **Slim drives:** Hot-swap drive CRUs that are slightly smaller in size than the standard disk drive. These drive CRUs do not fill the entire drive bay. To maintain proper air flow and cooling, you must use a slim filler piece with each slim drive.

Replacing hot-swap drives

Drive problems include any malfunctions that delay, interrupt, or prevent successful I/O activity between the hosts and the hard disk drives in the storage unit. This section explains how to replace a failed drive.

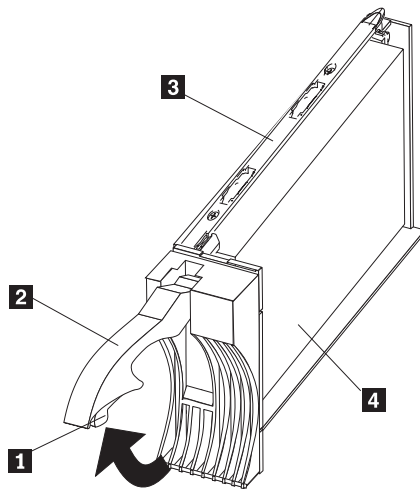
Attention: Failure to replace the drives in their correct bays might result in loss of data. If you are replacing a drive that is part of a RAID level 1 or RAID level 5 logical drive, ensure that you install the replacement drive in the correct bay.

Check the hardware and software documentation provided with your system to see if there are restrictions regarding hard disk drive configurations. Some system Fibre Channel (FC) configurations might not allow mixing different drive capacities or types within an array.

1. Determine the location of the drive that you want to remove.

Attention: Never hot-swap a drive CRU when its green Activity LED is flashing. Hot-swap a drive CRU only when its amber Fault LED is completely on and not flashing, or when the drive is inactive with the green Activity LED completely on and not flashing.

2. Remove the drive CRU.
 - a. Press on the inside of the bottom of the tray handle to release the blue latch **1**.
 - b. Pull the handle **2** on the tray **3** out into the open position.
 - c. Lift the drive CRU partially out of the bay.
 - d. To avoid possible damage to the drive **4**, wait at least 20 seconds before fully removing the drive CRU from the storage unit to allow for the drive to spin down.



- e. Verify that there is proper identification (such as a label) on the drive CRU, then slide it completely out of the expansion unit.
 - f. Ensure that the filler piece remains in place for use with the new drive.
3. Install the new drive CRU.
 - a. Gently push the drive CRU into the empty bay until the tray handle **2** touches the storage unit bezel.
 - b. Push the tray handle **2** down into the closed (latched) position.
 4. Check the drive LEDs.
 - a. When a drive is ready for use, the green Activity LED is on and the amber Fault LED is off.

- b. If the amber Fault LED is completely on and not flashing, remove the drive from the unit and wait 10 seconds; then, reinstall the drive.
5. Return to normal operation.

Working with hot-swap power supplies

The power supplies are customer replaceable units (CRUs) and do not require preventive maintenance.

- The power supplies must always be in their proper places to maintain proper cooling.
- Use only the supported power supplies for your specific storage unit.

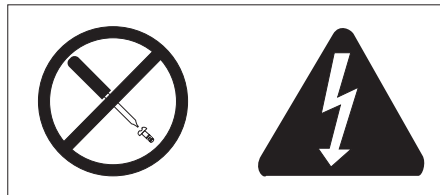
Removing a hot-swap power supply

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CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.

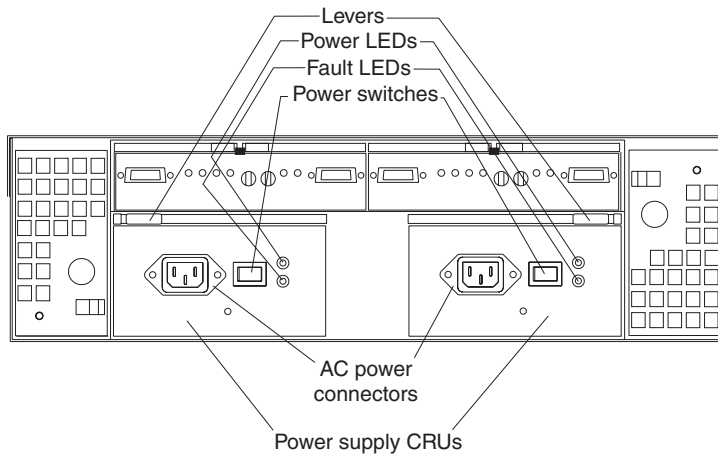


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: For safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

To remove a hot-swap power supply:

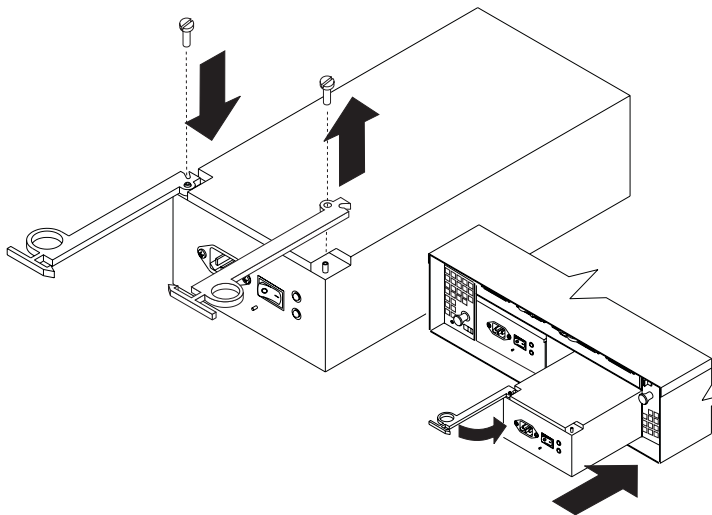
1. Turn the power supply switch to the OFF position.



2. Unplug the power supply cord from the electrical outlet.
3. Disconnect the power cord from the power supply.
4. Remove the nut and clamp from the rear of the power supply.
5. Remove the power supply from the storage unit.
 - a. Grasp the pull-ring on the power supply lever and squeeze the latch to release it.
 - b. Pull the lever open and remove the power supply.

Replacing a hot-swap power supply

Note: When replacing a power supply due to a failure, ensure that the power supply latch is mounted on the side of the power supply that faces the middle of the storage unit. If not, remove the lever screw, flip the lever over and tighten the screw on the opposite side.

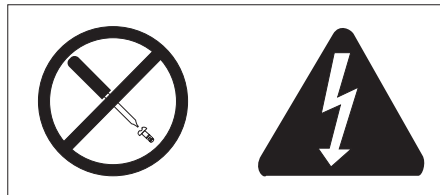


To replace a hot-swap power supply, perform the following steps:



CAUTION:

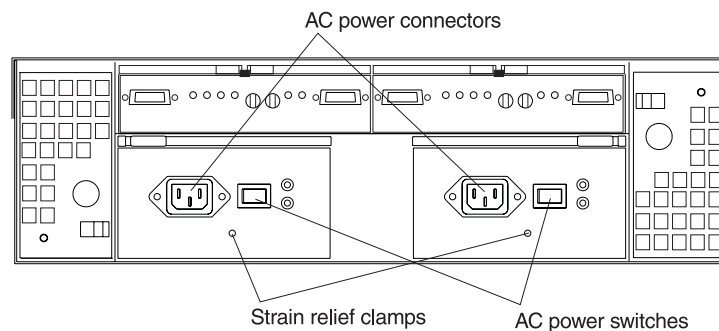
Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: For safety notice translations, see “Appendix I. Safety and environmental notices” on page 105.

1. Ensure that the ac power switch on the power supply you are installing is in the Off position.
2. Replace the power supply in the storage unit.
 - a. Slide the power supply into the storage unit. Be sure the lever is pulled straight out as you slide the power supply into the storage unit.
 - b. Close the lever until the pull-ring latch locks in place. Make sure that the lever locks into place.
3. Wrap the clamp around the power cord approximately 20 cm (8 in.) from the power supply connection end.
4. Attach the power supply nut and tighten it securely.
5. Connect the power cord to the power supply.



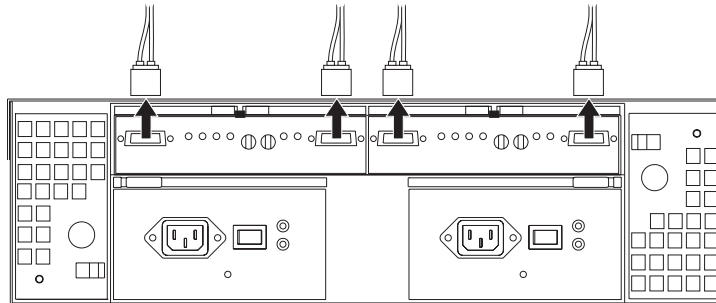
6. Plug the supply power cord into a properly grounded electrical outlet.
7. Turn the power supply switch to the ON position.

Working with hot-swap ESM boards

To replace an ESM board, perform the following steps:

1. Check the software documentation provided with your system for instructions on ESM board failure-recovery procedures. Follow the steps provided in the software documentation before continuing to step 2.
2. Label each cable to ensure that all cables are properly reconnected to the new ESM board.
3. Label the GBICs when you remove them. You must install the GBICs in the same positions on the new ESM board.
4. Remove the GBICs and FC cables from the failed ESM board.

Note: Be careful not to bend the FC cables at a sharp angle or pinch them with objects. This can decrease the performance or cause data loss.



5. To remove the failed ESM board (the Fault indicator light is lit), push down on the latch. The levers will pop out of the locked position.
6. Grasp the pull-rings and pull out on the levers, then remove the ESM board.
7. Set the tray numbers on the new ESM board to match the tray numbers on the failed ESM board.
8. Install the new ESM board by sliding it into the empty slot. Be sure the levers are pulled straight out as you slide the ESM board into the storage unit.
9. Close the levers until the pull-ring latch locks in place. Make sure that the levers lock into place.
10. Reattach the GBICs and FC cables to their original locations.
11. Check the Bypass LEDs at both ends of the reattached cables. If the Bypass LEDs are on, reattach the cables and GBICs.
12. Check the Power and Fault indicator lights on the new ESM board:
 - If the Power indicator is off, the ESM board might not be inserted correctly.
 - If the Fault indicator is lit, the Power indicator does not light, or any other Fault indicator is lit, refer to the *User's Reference*.
13. Refer to your storage-management software for instructions on enabling the ESM board.

Working with GBICs

The storage unit has four gigabit interface card (GBIC) ports (two on each ESM board). Use the GBIC ports to attach FC cables to the storage unit. For information on GBICs and handling fiber-optic cables, see “Working with GBICs and fiber-optic cables” on page 19.

Working with hot-swap cooling fans

Attention: Do not run the storage unit without adequate ventilation and cooling, because it might cause damage to the internal components and circuitry.

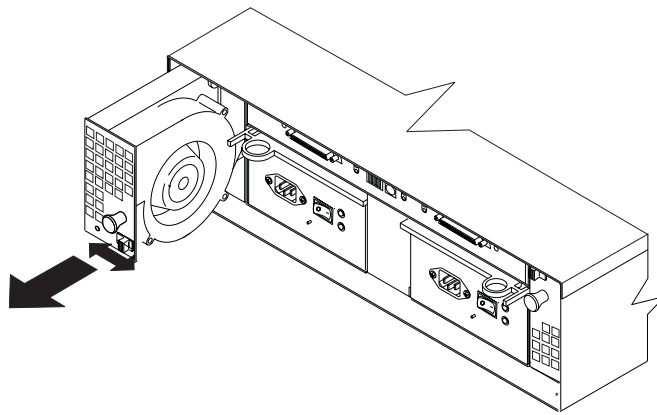
The fans are interchangeable and customer replaceable and do not require preventive maintenance. The fans help maintain proper air circulation across the components inside the storage unit. Air flows through the storage unit from the front to the back.

You can hot-swap the fans (replace them while the storage unit is turned on and running), as long as you complete the exchange within 10 minutes. This time limit applies only to the total time that a fan is out of the storage unit, beginning when you remove the failed unit and ending when you reseal the new one. This does not include the time it takes you to perform this entire procedure (checking LEDs, unpacking the new fan, and so on).

Both fan units must always be in place, even if one is not functioning properly, to maintain proper cooling.

Use the following procedure to replace a hot-swap fan:

1. Check the LEDs on the back of the storage unit.
2. If the amber Fault LED is on, remove the failed fan.
 - a. Slide the latch to unlock the fan CRU.
 - b. Use the handle (black knob) to pull the fan from the storage unit.



3. Install the new fan unit.
 - a. Place the fan CRU in front of the fan slot.
 - b. Hold the latch open and slide the fan all the way into the slot. If the fan does not go into the bay, rotate it 180°. Ensure that the latch is on the side closest to the center of the storage unit.
 - c. Release the latch. If the lever remains open, pull back on the fan slightly, then push it in again until the latch snaps into place.

4. Check the LEDs.

The Fault LEDs turn off after a few seconds; if they remain on, refer to the *User's Reference*.

Working with the Fibre Channel hub

In the IBM NAS 300, a Fibre Channel hub is considered to be a CRU and has no replaceable components. If a Fibre Channel hub is determined to be defective, the entire Fibre Channel hub must be replaced.

Removing a Fibre Channel hub

Note: You can use the same steps described here to remove a IBM NAS 300 engine.

To replace a Fibre Channel hub, perform the following steps:

1. Disconnect all cables and power cords taking note of the cable numbers for reconnecting to the new hub.
2. Remove the two locking screws securing the locking tabs on the Fibre Channel hub to the rack.
3. Slide the Fibre Channel hub out as far as possible.
4. Locate and press in the locking push-buttons on each side unlocking the inner moving slide bar.
5. Slide the Fibre Channel hub fully out and remove it from the rack.
6. Unscrew and remove the moving slide bar and the locking ears from the Fibre Channel hub. Retain the inner slide bars, locking tabs, and screws as they will be used to mount the new Fibre Channel hub.

Installing a new Fibre Channel hub

Note: You can use the same steps described here to install a new IBM NAS 300 engine.

To install a new Fibre Channel hub, perform the following steps:

1. Mount the moving slide and locking ears to the hub. Mount the moving portion of the slide first, and then the locking ears.
2. Insert the Fibre Channel hub and moving portion of the slides into the fixed portion of the slide on the rack. Align the portion of the rail mounted on the hub with the receiving rail members mounted in the rack. Push the hub all the way into the rack.
3. Slide the Fibre Channel hub back and forth on the rail several times to make sure it moves easily. Slide the 3534 Managed Hub fully back into the rack. Using the screws previously removed when the hub was replaced, lock the hub in the rack.

Appendix A. IBM NAS 300 Engine communication adapters

Each IBM NAS 300 engine comes standard with an built-in Ethernet controller to connect the engine to an Ethernet network and a FASiT host adapter (Fibre Channel) to connect the engine to a storage area network (SAN). You can also install the following optional adapters to enhance the capability of your IBM NAS 300:

- IBM 10/100 Ethernet Server adapters
- IBM Gigabit Ethernet SX Server adapters
- An IBM Netfinity Advanced System Management PCI adapter
- An IBM PCI Fast/Wide Ultra SCSI adapter

Ethernet adapters

IBM 10/100 Ethernet Controller

Your engine comes with an integrated Ethernet controller. This controller provides an interface for connecting to 10BASE-T Ethernet networks or 100BASE-TX FAST Ethernet networks and provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN).

When you connect your engine to the network, the Ethernet controller automatically detects the data-transfer rate (10 Mbps or 100 Mbps) on the network and then sets the controller to operate at the appropriate rate. That is, the Ethernet controller will adjust to the network data rate, whether the data rate is standard Ethernet (10BASE-T), Fast Ethernet (100BASE-TX), half duplex (HDX), or full duplex (FDX). The controller supports half-duplex (HDX) and full-duplex (FDX) modes at both speeds.

The Ethernet controller is a PCI Plug and Play device. You do not need to set any jumpers or configure the controller for your operating system before you use the Ethernet controller. However, you must install a device driver to enable your operating system to address the Ethernet controller. The device drivers are provided on the IBM NAS 300 Guide CDs.

IBM 10/100 Ethernet Server adapter

Optionally, you can add up to four additional IBM 10/100 Ethernet Server adapters.

Key Features:

- 66 MHz, 64/32-bit PCI Ethernet adapter
- Provides both 10BASE-T and 100BASE-TX connectivity over twisted-pair cabling

Requirements:

- For 10 BASE-T networks, you can use a Category 3, 4, or 5 unshielded twisted-pair (UTP) cable with RJ-45 connectors.
- For 100BASE-TX Fast Ethernet networks, you must use Category 5 or higher.

IBM Gigabit Ethernet SX Server adapters

Optionally, you can add a Gigabit adapter to connect to high-speed (1-Gb) networks. The Gigabit adapter provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the gigabit LAN.

Key Features:

- 66 MHz, 64-bit PCI Gigabit Ethernet adapter
- Can be paired with another Gigabit Ethernet SX adapter to achieve a high level of communication integrity
- Fully compliant with the IEEE 802.3z Gigabit Ethernet standard
- Support for optional jumbo frames

Gigabit adapters must be installed in 64-bit PCI slots (slot 3 or 4).

Requirements:

- Optical multimode cable with an SC-style duplex connector that meets 62.5/125um or 50/125um multimode specifications
- An IEEE 802.3z or 802.3ab compliant gigabit switch, or a buffered repeater

Advanced Systems Management

Each engine comes standard with one communication port dedicated to the Netfinity Advanced System Management Processor to allow you to manage the IBM NAS 300 at anytime from virtually anywhere. This port uses a standard D-shell serial-port connector, connector C. Also, the Netfinity Advanced System Management Processor shares Serial port A with the operating system.

Advanced Systems Management adapter

Key Features:

- 32-bit, industry-standard PCI interface
- Hardware and operating system independent; functions even if the server is down or powered off. Battery-backed event log automatically timestamps events for efficient problem determination
- Automatically forwarding alerts of critical events:
 - Over LAN or modem to Netfinity Manager Console
 - From a modem to an alpha-numerical or numerical pager
 - SNMP traps over LAN to an SNMP manager
- Access from Netfinity Manager Console
 - ANSI terminal (modem connection only)
 - Telnet session (LAN only)
 - Web browser interface (LAN only)
- Advanced System Management Interconnect allows connection of multiple Netfinity Advanced System Management processors and PCI adapters to eliminate:
 - Multiple modems
 - Telephone lines or modem-concentrating equipment
 - Unnecessary LAN ports required for dedicated management purposes

Requirements:

The Advanced Systems Management adapter should be installed in PCI slot 1

If you install the Advanced System Management Interconnect Cable option, it provides two additional ports. These two ports, which are used for the RS-485 function, use a dual RJ-45 connector.

You can attach a dedicated modem to the D-shell system-management connector on the rear of your engine to communicate with the integrated Netfinity Advanced System Management Processor.

The RS-485 function uses the RJ-45 system-management connectors. This function enables you to connect the Advanced System Management Processors so that they can communicate with each other in half-duplex mode.

IBM PCI Fast/Wide Ultra SCSI Adapter

Optionally, you can add a small computer system interface (SCSI) adapter to connect to a backup tape drive or other device. The adapter provides SCSI connectivity and is compatible and fully compliant with SCSI, SCSI-2, and SCSI-3 protocols.

Key Features:

- Direct Memory Access (DMA) — Allows the adapter to control the transfer of data from the peripherals to the system memory, relieving the system processor of this time consuming burden.
- SCSISelect configuration utility — The SCSISelect configuration utility resident in the adapters's BIOS allows simple, on-screen configuration of the adapter and eliminates the need to manipulate jumpers or terminators during the installation.
- 40 MBps sustained synchronous data transfer rate.
- 133 Mbps host bus transfer rate using a 32-bit PCI bus.
- Ability to handle any combination of 8-bit and 16-bit drives.

Appendix B. PCI Adapter Placement

Each IBM NAS 300 engine contains five PCI adapter slots. Table 5 shows where the PCI adapters should be installed. To use the table, look in the left column Configuration to locate the row that contains the list of adapters installed (or to be installed) in your engine. This row then shows where the adapters should be installed.

Example 1: If you have a single Gigabit adapter (in addition to the standard Fibre Channel installed in Slot-5), that adapter should be installed in slot-3.

Example 2: If you have four additional adapters—two 10/100 Ethernet adapters, one Advanced Management, and one Gigabit Ethernet adapter – they should be installed in the following PCI slots:

- Slot-1 — Advanced Management
- Slot-2 — 10/100 Ethernet
- Slot-3 — Gigabit Ethernet
- Slot-4 — 10/100 Ethernet
- Slot-5 — Fibre Channel (standard)

Table 5. PCI Adapter Placement

Configuration	PCI Slot-1 (32-bit)	PCI Slot-2(32- bit)	PCI Slot-3(64- bit)	PCI Slot-4 (64-bit)	PCI Slot-5 (64-bit)
<ul style="list-style-type: none"> • 10/100- 10/100 Ethernet • Gig- Gigabit Ethernet • AM- Advanced Mgmt • SCSI- Small Computer System Interface 					
SCSI				SCSI	FC-std
Gig			Gig		FC-std
10/100		10/100			FC-std
AM	AM				FC-std
SCSI, AM	AM			SCSI	FC-std
SCSI, 10/100		10/100		SCSI	FC-std
SCSI, Gig			Gig	SCSI	FC-std
AM, 10/100	AM	10/100			FC-std
AM, Gig	AM		Gig		FC-std
10/100, Gig		10/100	Gig		FC-std
10/100, 10/100		10/100	10/100		FC-std
Gig, Gig			Gig	Gig	FC-std
SCSI, AM, 10/100	AM	10/100		SCSI	FC-std
SCSI, AM, Gig	AM		Gig	SCSI	FC-std
SCSI, 10/100, Gig		10/100	Gig	SCSI	FC-std
SCSI, 10/100, 10/100		10/100	10/100	SCSI	FC-std
SCSI, Gig, Gig		SCSI	Gig	Gig	FC-std
AM, 10/100, 10/100	AM	10/100	10/100		FC-std
AM, 10/100, Gig	AM	10/100	Gig		FC-std

Table 5. PCI Adapter Placement (continued)

AM, Gig, Gig	AM		Gig	Gig	FC-std
10/100, 10/100, 10/100	10/100	10/100	10/100		FC-std
Gig, 10/100, 10/100	10/100	10/100	Gig		FC-std
Gig, Gig, 10/100		10/100	Gig	Gig	FC-std
SCSI, AM, 10/100,10/100	AM	10/100	10/100	SCSI	FC-std
SCSI, 10/100, 10/100, 10/100	10/100	10/100	10/100	SCSI	FC-std
SCSI, AM, 10/100, Gig	AM	10/100	Gig	SCSI	FC-std
SCSI, AM, Gig, Gig	AM	SCSI	Gig	Gig	FC-std
SCSI, 10/100, Gig, Gig	SCSI	10/100	Gig	Gig	FC-std
SCSI, Gig, 10/100, 10/100	10/100	10/100	Gig	SCSI	FC-std
AM, 10/100, 10/100, 10/100	AM	10/100	10/100	10/100	FC-std
AM, 10/100, 10/100, Gig	AM	10/100	Gig	10/100	FC-std
AM, 10/100, Gig, Gig	AM	10/100	Gig	Gig	FC-std
10/100, 10/100, 10/100, 10/100	10/100	10/100	10/100	10/100	FC-std
Gig, 10/100, 10/100, 10/100	10/100	10/100	Gig	10/100	FC-std

Appendix C. Power Cable Placement

This appendix describes how the ac power is distributed throughout the IBM NAS 300 and how each of the IBM NAS 300 components are connected to this power source

Each IBM NAS 300 has two 3-phase power cords that connect to its own front-end power distribution unit (PDU). Each front-end PDU distributes the power to its own three single-phase PDUs. Because the RAID storage controllers and storage units each have dual power supplies, these power supplies are connected to different single phase PDUs, thus providing a level of power redundancy in the event an incoming supply should fail.

Your IBM NAS 300 comes pre-cabled for a maximum configuration. That means if you are adding components at a later time, the power cords have been preinstalled in the rack and you only need to attach the correct power cable to the newly installed component. Use Table 6 to determine which power cord you should use.

Example: If you install your first storage unit, you would install it in slot 2 which is directly above the first RAID storage controller. You would connect the powercord with the label “2” to the left power supply and the powercord with the label “15” to the right power supply.

Table 6. Power cord placement

IBM NAS 300 Component	Location in rack	Left powercord (as viewed from rear)	Right powercord (as viewed from rear)
First storage unit	slot-2 (directly above RAID storage controller #1)	2	15
Second storage unit	slot-3 (directly above storage unit #1)	3	16
Third storage unit	slot-4(directly above storage unit #2)	4	17
Fourth storage unit	slot-5 (directly above storage unit #3)	5	18
Second RAID storage controller	slot-6 (directly above storage unit #4)	6	19
Fifth storage unit	slot-7 (directly above RAID storage controller #2)	7	20
Sixth storage unit	slot-8 (directly above storage unit #5)	8	21
Seventh storage unit	slot-9 (directly above storage unit #6)	9	22

Appendix D. Signal Cable Placement

This appendix describes how to connect the fiber-optic signal cables between the RAID storage controllers and the Fibre Channel hub and any installed storage units.

Each IBM NAS 300 contains standard with a single RAID storage controller (referred to as RAID storage controller # 1). This RAID storage controller comes standard with 10 hard disk drives. For additional storage you can add up to four storage units; each storage unit containing 10 hard disk drives. For more storage you can add a second RAID storage controller (referred to as RAID storage controller # 2) and then connect up to three additional storage units to this second RAID storage controller.

The following illustration shows a fully-configured IBM NAS 300 and shows how the various IBM NAS 300 components are cabled together.

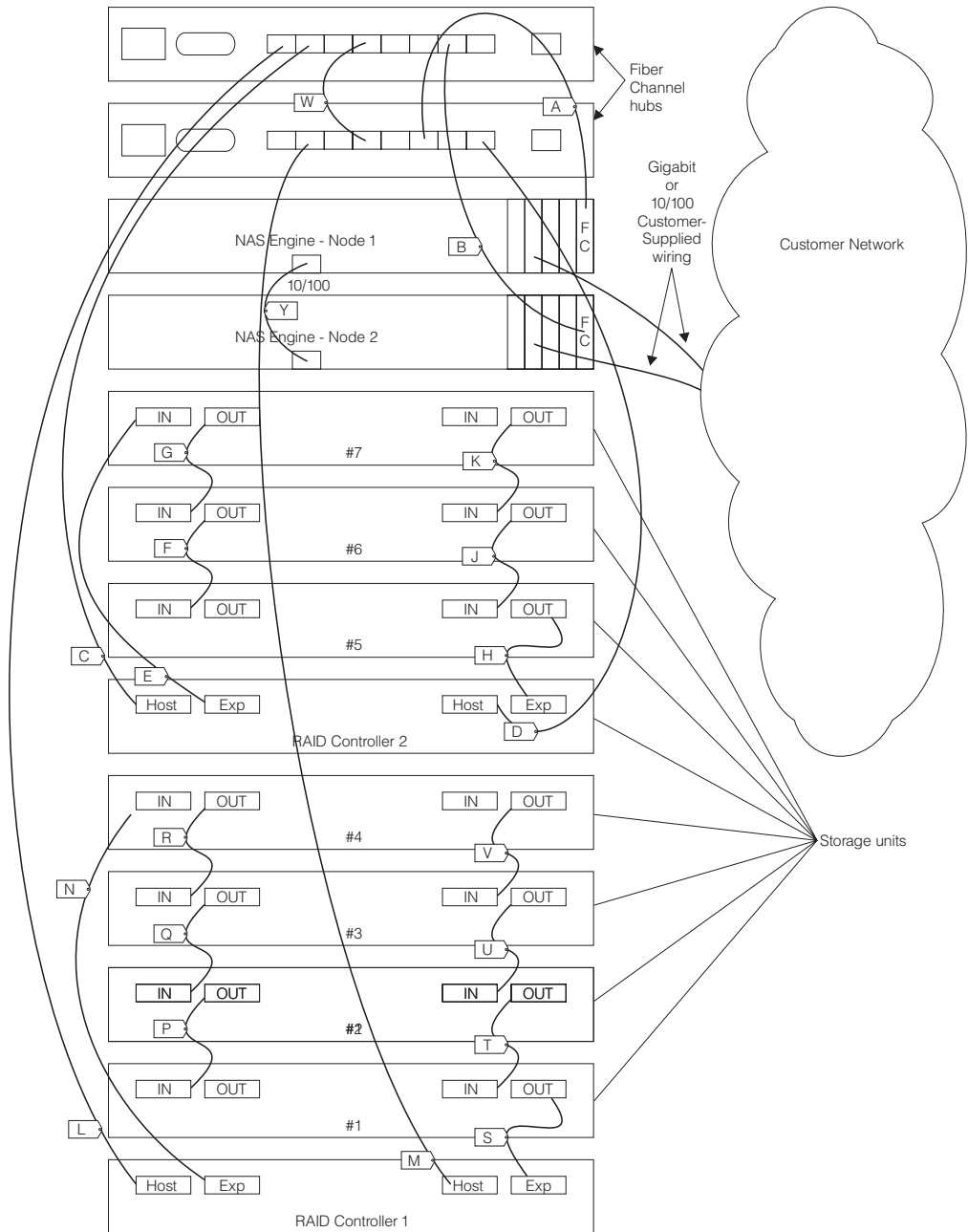


Table 7 on page 83 shows how to connect all the fiber optic cables to RAID storage controller #1 and to any storage units managed by RAID storage controller #1.

Table 8 on page 84 shows how to connect all the fiber optic cables to RAID storage controller #2 and to any storage units managed by RAID storage controller #2.

Example: If you were adding two new storage units to a base IBM NAS 300 (one RAID storage controller and no storage units), you would refer to Table 7 on page 83 find section "If you have RAID storage controller #1 and two storage units (SU #1 and SU #2)." You would need to install cables N, S, P, and T.

Table 7. Cable Placement for RAID storage controller #1

—If you have RAID storage controller #1 only (no storage units)		
Cable ID	From	To
L	Fibre Channel hub #1 port 1	RAID storage controller #1 Left Host
M	Fibre Channel hub #2 port 1	RAID storage controller #1 Right Host
No cables in RAID storage controller #1 Left EXP or RAID storage controller #1 Right EXP		
—If you have RAID storage controller #1 and one storage unit (SU #1)		
Cable ID	From	To
L	Fibre Channel hub #1 port 1	RAID storage controller #1 Left HOST
M	Fibre Channel hub #2 port 1	RAID storage controller #1 Right HOST
N	RAID storage controller #1 Left EXP	SC #1 Left IN
S	RAID storage controller #1 Right EXP	SC #1 Right OUT
No cables in SC #1 Left OUT or SC #1 Right IN		
—If you have RAID storage controller #1 and two storage units (SU #1 and SU #2)		
Cable ID	From	To
L	Fibre Channel hub #1 port 1	RAID storage controller #1 Left HOST
M	Fibre Channel hub #2 port 1	RAID storage controller #1 Right HOST
N	SC #2 Left IN	RAID storage controller #1 Left EXP
S	SC #1 Right OUT	RAID storage controller #1 Right EXP
P	SC #2 Left OUT	SC #1 Left IN
T	SC #2 Right OUT	SC #1 Right IN
No cables in SC #1 Left OUT or SC #2 Right IN		
—If you have RAID storage controller #1 and three storage units (SU #1, SU #2, and SU #3)		
Cable ID	From	To
L	Fibre Channel hub #1 port 1	RAID storage controller #1 Left HOST
M	Fibre Channel hub #2 port 1	RAID storage controller #1 Right HOST
N	SC #3 Left IN	RAID storage controller #1 Left EXP
S	SC #1 Right OUT	RAID storage controller #1 Right EXP
P	SC #2 Left OUT	SC #1 Left IN
T	SC #2 Right OUT	SC #1 Right IN
Q	SC #3 Left OUT	SC #2 Left IN
U	SC #3 Right OUT	SC #2 Right IN
No cables in SC #1 Left OUT or SC #3 Right IN		
—If you have RAID storage controller #1 and four storage units (SU #1, SU #2, SU #3, and SU #4)		
Cable ID	From	To
L	Fibre Channel hub #1 port 1	RAID storage controller #1 Left HOST

Table 7. Cable Placement for RAID storage controller #1 (continued)

M	Fibre Channel hub #2 port 1	RAID storage controller #1 Right HOST
N	SC #4 Left IN	RAID storage controller #1 Left EXP
S	SC #1 Right OUT	RAID storage controller #1 Right EXP
P	SC #2 Left OUT	SC #1 Left IN
T	SC #2 Right OUT	SC #1 Right IN
Q	SC #3 Left OUT	SC #2 Left IN
U	SC #3 Right OUT	SC #2 Right IN
R	SC #4 Left OUT	SC #3 Left IN
V	SC #4 Right OUT	SC #3 Right IN
No cables in SC #1 Left OUT or SC #4 Right IN		

Table 8. Cable Placement for RAID storage controller #2

—If you have RAID storage controller #2 only (no storage units)		
Cable ID	From	To
C	Fibre Channel hub #1 port 2	RAID storage controller #2 Left Host
D	Fibre Channel hub #2 port 2	RAID storage controller #2 Right Host
No cables in RAID storage controller #2 Left EXP or RAID storage controller #2 Right EXP		
—If you have RAID storage controller #2 and one storage unit (SU #5)		
Cable ID	From	To
C	Fibre Channel hub #1 port 2	RAID storage controller #2 Left HOST
D	Fibre Channel hub #2 port 2	RAID storage controller #2 Right HOST
E	RAID storage controller #2 Left EXP	SC #5 Left IN
H	RAID storage controller #2 Right EXP	SC #5 Right OUT
No cables in SC #5 Left OUT or SC #5 Right IN		
—If you have RAID storage controller #2 and two storage units (SU #5 and SU #6)		
Cable ID	From	To
C	Fibre Channel hub #1 port 2	RAID storage controller #2 Left HOST
D	Fibre Channel hub #2 port 2	RAID storage controller #2 Right HOST
E	SC #6 Left IN	RAID storage controller #2 Left EXP
H	SC #5 Right OUT	RAID storage controller #2 Right EXP
F	SC #6 Left OUT	SC #5 Left IN
J	SC #6 Right OUT	SC #5 Right IN
No cables in SC #5 Left OUT or SC #6 Right IN		
—If you have RAID storage controller #1 and three storage units (SU #5, SU #6, and SU #7)		
Cable ID	From	To
C	Fibre Channel hub #1 port 2	RAID storage controller #2 Left HOST
D	Fibre Channel hub #2 port 2	RAID storage controller #2 Right HOST

Table 8. Cable Placement for RAID storage controller #2 (continued)

E	SC #7 Left IN	RAID storage controller #2 Left EXP
H	SC #5 Right OUT	RAID storage controller #2 Right EXP
F	SC #6 Left OUT	SC #5 Left IN
J	SC #6 Right OUT	SC #5 Right IN
G	SC #7 Left OUT	SC #6 Left IN
K	SC #7 Right OUT	SC #6 Right IN
No cables in SC #5 Left OUT or SC #7 Right IN		

Appendix E. Getting help, service, and information

If you need help, service, technical assistance, or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you.

IBM maintains pages on the World Wide Web where you can get information about IBM products and services and find the latest technical information.

Table 9 lists some of these pages.

Table 9. IBM Web sites for help, services, and information

www.ibm.com	Main IBM home page
www.ibm.com/storage	IBM Storage home page
www.ibm.com/storage/support/nas	IBM NAS Support home page

You might also want to visit the Web pages of other companies for information about other operating systems, software, and accessories. The following are some other Web sites you might find helpful:

www.tivoli.com
www.cdpi.com

Services available and telephone numbers listed are subject to change without notice.

Service support

With the original purchase of an IBM hardware product, you have access to extensive support coverage. During the IBM hardware product warranty period, you may call the IBM Support Center (1-800-426-7378 in the U.S.) for hardware product assistance covered under the terms of the IBM hardware warranty. See “Getting help by telephone” on page 89 for Support Center telephone numbers in other countries.

The following services are available during the warranty period:

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- IBM hardware repair - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make Engineering Changes (ECs) available that apply to your hardware.

Be sure to retain your proof of purchase to obtain warranty service.

Please have the following information ready when you call:

- Machine Type and Model
- Serial numbers of your IBM hardware products

- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

If possible, be at your computer when you call.

A compatible monitor, keyboard, and mouse may be required for some service activities.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts

Note: All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXXX.

- Identification of software problem sources
- Configuration of BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of application programs

Refer to your IBM hardware warranty for a full explanation of IBM's warranty terms.

Before you call for service

Many computer problems can be solved without outside assistance, by using the online help or by looking in the online or printed documentation that comes with your IBM NAS 300. Also, be sure to read the information in any README files that come with your software.

Your IBM NAS 300 comes with documentation that contains troubleshooting procedures and explanations of error messages. The documentation that comes with your appliance also contains information about the diagnostic tests you can perform.

If you receive a POST error code or beep code when you turn on your IBM NAS 300, refer to the POST error-message charts in your hardware documentation. If you do not receive a POST error code or beep code, but suspect a hardware problem, refer to the troubleshooting information in your hardware documentation or run the diagnostic tests.

If you suspect a software problem, consult the documentation (including any README files) for the operating system or application program.

Getting customer support and service

Purchasing an IBM Network Attached Storage appliance entitles you to standard help and support during the warranty period. If you need additional support and services, a wide variety of extended services are available for purchase that address almost any need.

Getting help online: www.ibm.com/storage/support/nas

Here you can visit a support page that is specific to your hardware, complete with FAQs, parts information, technical hints and tips, technical publications, and downloadable files, if applicable.

Getting help by telephone

During the warranty period, you can get help and information by telephone through the IBM Support Center. Expert technical-support representatives are available to assist you with questions you might have on the following:

- Setting up your Network Attached Storage appliance
- Arranging for service
- Arranging for overnight shipment of customer-replaceable parts

In addition, if you purchased a Network Attached Storage appliance, you are eligible for IBM up and running support for 90 days after installation. This service provides assistance for:

- Setting up your IBM NAS 300
- Limited configuration assistance

Please have the following information ready when you call:

- Machine Type and Model
- Serial numbers of your appliance and other components, or your proof of purchase
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information for your system

If possible, be at your computer when you call.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m.¹

Table 10 provides the telephone numbers.

Table 10. Telephone numbers for warranted help and information

Country		Number
Austria	Österreich	1-546 585 075
Belgium - Dutch	Belgie	02-717-2504
Belgium - French	Belgique	02-717-2503
Canada	Canada	1-800-565-3344
Denmark	Danmark	03-525-6905
Finland	Suomi	9-22-931805
France	France	01-69-32-40-03
Germany	Deutschland	069-6654-9003
Ireland	Ireland	01-815-9207
Italy	Italia	02-4827-5003
Luxembourg	Luxembourg	298-977-5060
Netherlands	Nederland	020-504-0531
Norway	Norge	2-305-3203
Portugal	Portugal	01-791-5147
Spain	España	091-662-4270

¹ Response time will vary depending on the number and complexity of incoming calls.

Table 10. Telephone numbers for warranted help and information (continued)

Sweden	Sverige	08-632-0063
Switzerland - German	Schweiz	01-212-1810
Switzerland - French	Suisse	022-310-0418
Switzerland - Italian	Svizzera	091-971-0523
United Kingdom	United Kingdom	01475-555555
U.S.A. and Puerto Rico	U.S.A. and Puerto Rico	1-800-426-7378

In all other countries, contact your IBM reseller or IBM marketing representative.

Appendix F. Purchasing additional services

During and after the warranty period, you can purchase additional services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and name might vary by country.

Warranty and repair services

You can upgrade your standard hardware warranty service or extend the service beyond the warranty period.

Warranty upgrades in the U.S. include:

- On-site service to premium on-site service

If your warranty provides for on-site service, you can upgrade to premium on-site service (4-hour average on-site response, 24 hours a day, 7 days a week).

You also can extend your warranty. Warranty and Repair Services offers a variety of post-warranty maintenance options. Availability of the services varies by product.

For more information about warranty upgrades and extensions:

- In the U.S., call 1-800-426-4343.
- In Canada, call 1-800-465-7999.
- In all other countries, contact your IBM reseller or IBM marketing representative.

Appendix G. Product warranties and notices

This chapter contains warranty and emission notices. It also contains trademarks and general-information notices.

Warranty Statements

The warranty statements consist of two parts: Part 1 and Part 2. Part 1 varies by country. Part 2 is the same for all countries. Be sure to read both the Part 1 that applies to your country and Part 2.

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**
("Part 1 - General Terms")
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
("Part 1 - General Terms" on page 96)
- **Worldwide Country-Unique Terms**
("Part 2 - Worldwide Country-Unique Terms" on page 98)

IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. **The terms of Part 2 may replace or modify those of Part 1.** The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine- Network Attached Storage 300

Warranty Period - One Year

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 sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at

least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty

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

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service

To obtain warranty service for the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-426-7378. In Canada, call IBM at 1-800-565-3344. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the

removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
 - b. secure all programs, data, and funds contained in a Machine,
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
 - d. 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.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status

Each IBM 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 appropriate warranty terms apply.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES

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IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 – General Terms)

This Statement of Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. ***The terms of Part 2 may replace or modify those of Part 1.*** The warranties provided by IBM in this Statement of Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine-Network Attached Storage 300

Warranty Period - One Year

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 sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

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JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty

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

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service

To obtain warranty service for the Machine, contact your reseller or IBM. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
 - b. secure all programs, data, and funds contained in a Machine,
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and

- d. 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.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status

Each IBM 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 appropriate warranty terms apply.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Part 2 - Worldwide Country-Unique Terms

ASIA PACIFIC

AUSTRALIA: The IBM Warranty for Machines: The following paragraph is added to this Section:

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment,

operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

Limitation of Liability: The following is added to this Section:

Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:

The laws of the State of New York govern this Statement.

INDIA: Limitation of Liability: The following replaces items 1 and 2 of this Section:

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

NEW ZEALAND: The IBM Warranty for Machines: The following paragraph is added to this Section:

The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: The following is added to this Section:

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of

Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

EGYPT: Limitation of Liability: The following replaces item 2 in this Section:
2. as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

FRANCE: Limitation of Liability: The following replaces the second sentence of the first paragraph of this Section:

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY: The IBM Warranty for Machines: The following replaces the first sentence of the first paragraph of this Section:

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months.

In case IBM or your reseller are unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: The second paragraph does not apply.

Warranty Service: The following is added to this Section:

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Production Status: The following paragraph replaces this Section:

Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

Limitation of Liability: The following is added to this Section:

The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

In item 2, replace "U.S. \$100,000" with "1.000.000 DEM."

The following sentence is added to the end of the first paragraph of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

IRELAND: Extent of Warranty: The following is added to this Section:
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: The following replaces items one and two of the first paragraph of this Section:

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to the greater of Irish Pounds 75,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY: Limitation of Liability: The following replaces the second sentence in the first paragraph:

In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: (item 1 unchanged) 2) as to any other actual damage arising in all situations involving non-performance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the second paragraph of this Section:

Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: (items 1 and 2 unchanged) 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND:

Limitation of Liability: The following is added to this Section:

IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

TURKIYE: Production Status: The following replaces this Section:

IBM fulfills customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

UNITED KINGDOM: Limitation of Liability: The following replaces items 1 and 2 of the first paragraph of this Section:

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; 2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if

recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default will be limited to damages.

NORTH AMERICA

CANADA: Warranty Service: The following is added to this section:

To obtain warranty service from IBM, call **1-800-565-3344**.

UNITED STATES OF AMERICA: Warranty Service: The following is added to this section:

To obtain warranty service from IBM, call **1-800-772-2227**.

Power cords

The IBM NAS 300 comes pre-wired with the power cords needed for maximum configuration (two RAID storage controllers and seven storage units). There are three different lengths of power cords that run from a IBM NAS 300 component to a PDU. There is also a separate power cord for the Advanced System Manager (ASM) adapter. If you should need to replace a defective power cord, see Table 11.

Table 11. IBM NAS 300 power cords

IBM power cord part number	Description
36L8858	Power cord, 2 feet
36L8859	Power cord, 3 feet
36L8860	Power cord, 5 feet
00N7691	Power cord, from PDU to ASM adapter

Appendix H. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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UNIX is a trademark or registered trademark of The Open Group in the United States and other countries.

Windows NT is a trademark or registered trademark of Microsoft Corporation.

Appendix I. Safety and environmental notices

The following sections describe the safety and environmental items you must consider for an IBM Network Attached Storage Appliance.

Safety notices

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb.) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



Caution:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the appliance covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.
Remember: Another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
 - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators
 - Similar units

This practice ensures correct grounding of the units.

- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:

- a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
 5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
 6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
 7. Check for worn, frayed, or pinched cables.
 8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Translated safety notices

The safety notices in this section are provided in the following languages:

- English
- Brazilian Portuguese
- Chinese
- French
- German
- Italian
- Korean
- Spanish

Important: All safety notices in the *Appliance Library* begin with a number. This number is used to cross-reference an English caution or danger notice with translated versions of the caution or danger notice in this section.

Be sure to read all safety notices before performing any of the instructions.

Statement 1



DANGER

Electrical current from power, telephone and communication cables is hazardous.

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.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3



CAUTION:

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



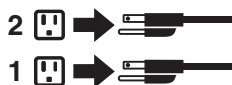
≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

- Statement 5



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 10



CAUTION:
Do not place any object weighing more than 82 kg (180 lb.) on top of rack-mounted devices.



Importante:

Todas as instruções de cuidado e perigo da *appliance Library* começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1



PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	Para Desconectar:
<ol style="list-style-type: none"> 1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos. 	<ol style="list-style-type: none"> 1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.

Instrução 2



CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3



PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ótica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.



PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos óticos, e evite exposição direta ao raio.

Instrução 4



≥18 kg (37 lbs)



≥32 kg (70,5 lbs)



≥55 kg (121,2 lbs)

CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5



CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



CUIDADO:

Instrução 10



CUIDADO:



Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

重要:

中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

声明 1



危险

电源、电话和通信电缆中带有危险电流。

为避免电击：

雷电期间不要拆接电缆或安装、维修及重新配置本产品。

将所有电源线连接至正确布线并已安全接地的电源插座上。

将与本产品连接的所有设备连接至正确布线的插座上。

尽量只使用单手拆接信号电缆。

有水、火及结构损坏迹象时，请勿打开任何设备。

除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。

安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

连接时：

1. 关闭所有设备。
2. 首先将所有电缆连接至设备。
3. 将信号电缆连接至接口。
4. 将电源线连接至插座。

断开连接时：

1. 关闭所有设备。
2. 首先从插座中拔出电源线。
3. 从接口上拔下信号电缆。

声明 2



警告:

更换锂电池时，只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池，则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂，如果使用、拿放或处理不当，可能会发生爆炸。

请勿对电池进行下列操作：
扔入或浸入水中
加热超过 100 (212 F)
进行修理或分解
请按本地法规要求处理电池。

声明 3



警告:

安装激光产品（如 CD-ROM、DVD 驱动器、光纤设备或送话器）时，应注意以下事项：

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险，本设备中没有用户可维修的部件。

非此处指定的其它控制、调整或与性能有关的操作都有可能导致激光辐射的危险。



危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。
打开时会产生激光辐射。不要直视光束，不要使用光学仪器直接观看光束，避免直接暴露于光束之下。

声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



≥55 kg (121.2 磅)

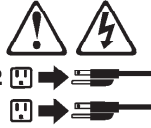
警告：
抬起时请采用安全操作方法。

声明 5



警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。
另外，本设备可能带有多条电源线。如要断开设备上的所有电流，请确保所有电源线均已与电源断开连接。



声明 6



警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至使用方便的电源。

声明 7



警告:

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应拨下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)

声明 11



警告：

下面的标签表明附近有锋利的边、角或接头。



声明 12



警告：

下面的标签表明附近有高热表面。



重要資訊：

中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1



危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

1. 關閉所有開關。
2. 先將所有電纜線接上裝置。
3. 將信號電纜接上接頭。
4. 再將電源線接上電源插座。
5. 開啓裝置的電源。

切斷：

1. 關閉所有開關。
2. 先自電源插座拔掉電源線。
3. 拔掉接頭上的所有信號電纜。
4. 再拔掉裝置上的所有電纜線。

聲明 2



注意：

更換鋰電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 °C (212 °F)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：

安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

聲明 4



≥ 18 公斤 (37 磅)



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

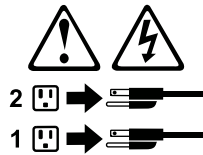
注意：

抬起裝置時，請注意安全措施。

聲明 5



注意：
裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。
本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：
請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。



> 82 公斤 (180 磅)

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque *appliance* sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.



DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

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.**
- **Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.**
- **Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.**
- **Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.**
- **Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.**
- **Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relie aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).**
- **Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

Connexion	Déconnexion
<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Commencez par brancher tous les cordons sur les unités.3. Branchez les câbles d'interface sur des connecteurs.4. Branchez les cordons d'alimentation sur des prises.5. Mettez les unités sous tension.	<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Débranchez les cordons d'alimentation des prises.3. Débranchez les câbles d'interface des connecteurs.4. Débranchez tous les câbles des unités.



Notice n° 2

ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- **Ne la jetez pas à l'eau.**
- **Ne l'exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.



Notice n° 3

ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- **N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.**



DANGER

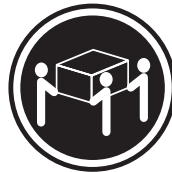
Certains produits laser contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. Évitez une exposition directe au rayon.

Notice n° 4



≥18 kg



≥32 kg



≥55 kg

ATTENTION:

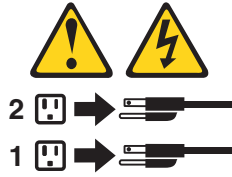
Faites-vous aider pour soulever ce produit.

Notice n° 5



ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10



ATTENTION:

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.

Wichtig:

Alle Sicherheitshinweise in dieser *server-Bibliothek* beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die Übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1



VORSICHT

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.

- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	Kabel lösen:
<ol style="list-style-type: none"> 1. Alle Geräte ausschalten und Netzstecker ziehen. 2. Zuerst alle Kabel an Einheiten anschließen. 3. Signalkabel an Anschlußbuchsen anschließen. 4. Netzstecker an Steckdose anschließen. 5. Gerät einschalten. 	<ol style="list-style-type: none"> 1. Alle Geräte ausschalten. 2. Zuerst Netzstecker von Steckdose lösen. 3. Signalkabel von Anschlußbuchsen lösen. 4. Alle Kabel von Einheiten lösen.

Hinweis 2



ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100° C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3



ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie Folgendes:

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.



VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

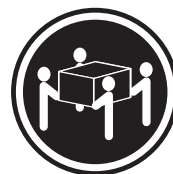
Hinweis 4



≥18 kg



≥32 kg



≥55 kg

ACHTUNG:

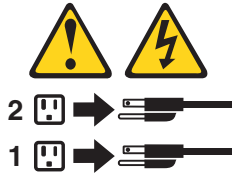
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Gerätes und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für das Gerät nicht unterbrochen. Das Gerät könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Gerätes auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 10



ACHTUNG:



Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione *appliance Library* iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1



PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	Per scollegare:
<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Collegare prima tutti i cavi alle unità.3. Collegare i cavi di segnale ai connettori.4. Collegare i cavi di alimentazione alle prese elettriche.5. ACCENDERE le unità.	<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.3. Rimuovere i cavi di segnale dai connettori.4. Rimuovere tutti i cavi dalle unità.

Avviso 2



ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3



ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4



≥18 kg



≥32 kg



≥55 kg

ATTENZIONE:

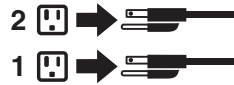
Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5



ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 10



ATTENZIONE:



Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

경고문 1



위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한 한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:

1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.
3. 신호 케이블을 커넥터에 연결합니다.
4. 콘센트에 전원 코드를 연결합니다.
5. 장치 스위치를 켭니다.

연결을 끊으려면:

1. 모든 스위치를 끕니다.
2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에서 제거합니다.
4. 장치에서 모든 케이블을 제거합니다.

경고문 2



주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:

레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.



위험

일부 레이저 제품에는 클래스 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 4



≥18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



주의:

장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는지 확인하십시오.



경고문 10



주의:

서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.



> 82 kg (180 lbs)

Importante:

Todas las declaraciones de precaución de esta *Biblioteca del servidor* empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaración de precaución o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta sección.

Por ejemplo, si una declaración de peligro empieza con el número 1, las traducciones de esta declaración de precaución aparecen en esta sección bajo Declaración 1.

Lea atentamente todas las declaraciones de precaución y peligro antes de llevar a cabo cualquier operación.

Declaración 1



PELIGRO

La corriente eléctrica de los cables telefónicos, de alimentación y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalación, mantenimiento o reconfiguración de este producto durante una tormenta.
- Conecte cada cable de alimentación a una toma de alimentación eléctrica con conexión a tierra y cableado correctos.
- Conecte a tomas de alimentación con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de señal.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundación o de daños estructurales.
- Desconecte los cables de alimentación, sistemas de telecomunicaciones, redes y módems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalación y configuración.

- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operación de instalación, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexión	Para la desconexión
<ol style="list-style-type: none"> 1. APÁGUELO todo. 2. En primer lugar, conecte los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Conecte cada cable de alimentación a la toma de alimentación. 5. ENCIENDA el dispositivo. 	<ol style="list-style-type: none"> 1. APÁGUELO todo. 2. En primer lugar, retire cada cable de alimentación de la toma de alimentación. 3. Retire los cables de señal de los conectores. 4. Retire los cables de los dispositivos.

Declaración 2



PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislación local.

Declaración 3



PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiación láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realización de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposición perjudicial a las radiaciones.



PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4



≥18 kg (37 libras)



≥32 kg (70,5 libras)



≥55 kg (121,2 libras)

PRECAUCIÓN:

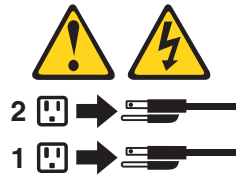
Tome medidas de seguridad al levantar el producto.

Declaración 5



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10



PRECAUCIÓN:



No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

Environmental notices

Electronic emission notices

Federal Communications Commission (FCC) Statement *Federal Communications Commission (FCC) Class A 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. Operation 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 must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet 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 operation.

Industry Canada Class A emission compliance statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003 of Industry Canada.

Avis de Conformité aux normes d'Industrie Canada

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller : *Appareils Numériques*, NMB-003 édictée par Industrie Canada.

Australia and New Zealand Class A statement

Attention: 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.

United Kingdom telecommunications safety requirement **Notice to Customers**

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union (EU) conformity statement

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed

communication equipment.

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.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

EMC Directive 89/336/EEC Statements

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.

FCCA (Text für alle in Deutschland vertriebenen EN 55022 Klasse A Geräte.)

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336)

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist Scott Enke, Director, Worldwide Manufacturing Operations, PO Box 12195, 3039 Cornwallis, Research Triangle Park, NC U.S.A. 27709–2195.

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

“Warnung: Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.”

EN 50082-1 Hinweis:

“Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

Taiwan electrical emission statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Index

A

- activity LED 7, 8, 66
- adapter
 - considerations 33
 - installing 33
 - PCI 33
 - PCI bus, which 33
- adapters
 - installing 33
- additional services
 - purchasing 91
- Advanced System Management port
 - description 74
- air baffle 39
- aparter
 - SCSI 75

B

- back view 9
- bays
 - drive 7, 65
 - ESM 7
 - expansion unit 7
 - hot-swap drive 7, 65
- bezel
 - replacing 46
- BIOS
 - latest level 39
- blank tray filler 8

C

- cables
 - power 25
- CD-ROM drive
 - replacing 36
- clustering 7
- components
 - color 30
 - major 30
 - system board 30
- connecting cables 25
- connectors
 - external port connectors 32
 - GBIC 10
 - options 31
 - power supply 9
- controller, RAID 66
- controls
 - ESM boards 10
 - fan 9
 - front 8
 - power supply 9
 - rear 9
- cover
 - replacing 46

CRU

- drive, hot swap 7, 65
- ESM, hot swap 10
- fan, hot swap 7, 71
- power supply 67, 68
- power supply, hot swap 9

D

- description
 - activity LED 7, 8
 - clustering 7
 - fans, hot-swap 8
 - fault LED 7
 - general system error LED 8
 - hot swap 7
- DIMM. See memory module 37
- disk drive
 - replacing 35
- drive
 - bays 7
 - CRU 8
 - hot swap 7, 65
 - identification 65
 - LEDs, status 65
 - sizes 65
 - slim 65
 - status, LEDs 65
 - types supported 65, 66

E

- emergency shut down 26
- ESM board
 - location 7
 - replacing, attention 10
 - user controls 10
- ESM board, replacing 69
- ESM boards, working with 69
- Ethernet port
 - description 73
- expansion unit
 - CRUs 7
 - starting 26

F

- fan, replacing 45
- fans, hot-swap
 - controls and indicators 9
 - location 8
 - working with, warnings 70
- fault LED 7, 8, 71
- fault LEDs 9, 10
- fibre channel
 - connectors 10

- filler panel
 - power supply bay 40
- flashing LEDs 8, 65
- front controls 8

G

- GBICs, working with 70
- gigabit port
 - description 73

H

- handling static-sensitive devices 64
- hard disk drive
 - replacing 35
- hard-disk drive
 - hot-swap 7, 65
 - identification 65
 - LEDs 65
 - removing 66
 - slim 65
 - types supported 65, 66
- hardware installation 64
- hot swap
 - description 7
 - drive, replacing 65
 - drive bays 7
 - fan bays 8
 - fans, replacing 71
 - hardware 65
 - power supplies 67, 68
- hot-swap fan, replacing 45

I

- IDE device, installing 36
- indicators
 - fan 9
 - LED 8
 - LEDs 7, 8, 9, 10
 - power supply 9, 68
- initial power up 26
- input/output ports 73
- installing
 - adapters 33
 - hot-swap drives 65
 - power supply 68

L

- label
 - drive 65
- LED
 - fan 10
- LED (light-emitting diode)
 - activity 7, 8, 66
 - drive 65
 - ESM fault 10
 - fault 7, 8, 9, 10
 - flashing 8, 65

- LED (light-emitting diode) *(continued)*
 - general system error 8
 - power 8, 9, 11
- locations
 - bays 65
 - drive CRUs 7
 - ESM board 7
 - fans 7
 - power supply CRUs 7
- loop connectors, Fibre Channel 10

M

- major components 30
- memory module
 - replacing 37
 - supported 37
- microprocessor
 - replacing 39

N

- non-hot-swap drive, installing 36

P

- PCI
 - adapters 33
 - bus A 33
 - bus B 33
- PCI expansion slots
 - locations 33
- port
 - Advanced System Management 74
 - Ethernet 73
 - gigabit 73
- power
 - failure 26
 - outage, restoring 26
 - turning the unit on and off 26
- power cords 102
- power LEDs 9
- power-on LED 8
- power supply
 - backplane option 40
 - controls, indicators, and connectors 9
 - installing 68
 - redundant 9
 - removing 67
 - replacing 40
 - switches 9

R

- RAID controller 66
- rear view 9
- redundant power 9, 68
- removing
 - fans 71
 - hot-swap drive 65
 - power supply 67

- replacing
 - hot-swap drive 65
 - hot-swap fan 71
 - hot-swap power supply 67
- restoring power 26

S

- safety information
 - hazardous voltage 40
 - laser products 36
- safety requirements
 - general information 65
 - handling static-sensitive devices 64
 - laser cautions 19, 20
- SCSI adapter
 - description 75
- size, drive 65, 66
- slim drive, filler 8, 65
- slim-line drive, filler 8
- starting the expansion unit 26
- static-sensitive devices, handling 29, 64
- storage unit
 - controls 8
- support, clustering 7
- switch
 - power supply 9
- system board
 - external port connectors 32
 - options connectors 31
- system error LED 8

T

- turning the expansion unit on and off 26

U

- user controls, ESM boards 10

W

- warranty and repair 91

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