IBM xSeries 365 Types 8861, 8862

IBM

Hardware Maintenance Manual and Troubleshooting Guide

IBM xSeries 365 Types 8861, 8862

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IBM

> **Note**
>
> - Before using this information and the product it supports, read Appendix B, "Related service information," on page 147, and Appendix C, "Notices," on page 191.
>
> - **The latest version of this document is available at www.ibm.com/pc/support/.**

About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information for the IBM® xSeries® 365 Type 8861 server.

Important: This manual is intended for trained servicers who are familiar with IBM xSeries products. Before servicing an IBM product, be sure to review "Safety information" on page 147.

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

在安装本产品之前，请仔细阅读 Safety Information
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prenez connaissance de toutes les consignes de type Attention et

Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Online support

You can download the most current diagnostic, BIOS flash, and device driver files from http://www.ibm.com/pc/support/.

Contents

Chapter 1. Introduction

The IBM xSeries 365 server is a 3-U-high[1] rack model server for high-volume network transaction processing. This high-performance, symmetric multiprocessing (SMP) server is ideally suited for networking environments that require superior microprocessor performance, input/output (I/O) flexibility, and high manageability.

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your server. These design features make it possible for you to customize the system hardware to meet your needs today and provide flexible expansion capabilities for the future.

You can obtain up-to-date information about your server and other IBM server products at http://www.ibm.com/eserver/xseries/.

Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* contains information to help you solve problems yourself, and it contains information for a service technician. In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following documentation comes with the server:

- *Installation Guide*

  This printed document contains instructions for setting up the server and basic instructions for installing some options.

- *User's Guide*

  This document is in Portable Document Format (PDF) on the IBM *xSeries Documentation* CD. It provides general information about the server, including information about features, how to configure the server, and how to get help.

- *Option Installation Guide*

  This document is in PDF on the IBM *xSeries Documentation* CD. It contains detailed instructions for installing, removing, and connecting optional devices that the server supports.

- *Rack Installation Instructions*

  This printed document contains instructions for installing the server in a rack.

- *Safety Information*

  This document is in PDF on the IBM *xSeries Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

Depending on the server model, additional documentation might be included on the *IBM xSeries Documentation* CD.

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1. Racks are marked in vertical increments of 1.75 inches each. Each increment is referred to as a unit, or a "U". A 1-U-high device is 1.75 inches tall.

1

Notices and statements used in this publication

The caution and danger statements that appear in this document are also in the multilingual *Safety Information* document, which is on the IBM *xSeries Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following notices and statements are used in this document:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

The following information is a summary of the features and specifications of the server. Depending on the server model, some features might not be available, or some specifications might not apply.

Microprocessor:
- Intel Xeon™ Processor MP (frequency varies with server model, each MP processor functions as two logical processors)
  - Minimum: One
  - Maximum: Four
- Level-3 cache size varies with model
- 400 MHz front-side bus (FSB)

Memory:
- Type: error correcting code (ECC), double-data rate (DDR) SDRAM, PC2100 registered DIMMs with Chipkill™
- Supports 512 MB, 1 GB, and 2 GB DIMMs
- Capacity and features depend on server model:
  - Memory cassette with 8-DIMM-connector memory board
    - Minimum: 1 GB
    - Maximum: 16 GB
    - Interleaved
  - Memory cassette with 16-DIMM-connector memory board
    - Minimum: 1 GB
    - Maximum: 32 GB
    - Interleaved
    - Memory mirroring
    - Memory ProteXion™
    - Redundant bit steering

Drives standard:
- Slim diskette: 1.44 MB
- Slim CD-ROM: IDE (upgradable to DVD-ROM)

Hard disk drives:
- Slim-high Ultra320 hot-swap SCSI drives
- Maximum: Six

Active™ PCI-X expansion slots:
- One 33 MHz/64-bit PCI
- One 100 MHz/64-bit PCI-X
- Four 133 MHZ/64-bit PCI-X

Hot-swap cooling:

Six hot-swap fans

Hot-swap power supplies:

950 W (100-240 V ac)
- Minimum: One or two, depending on the server model
- Maximum: Two, for redundant power

Video:
- ATI RageXL video controller on I/O board, disabled when Remote Supervisor Adapter II is installed
- Compatible with SVGA 4
- 8 MB SDRAM video memory

Size (3 U)
- Height: 129 mm (5.07 in.)
- Depth: 715 mm (28.14 in.)
- Width: 444 mm (17.46 in.)
- Weight: 29 kg (63 lb) to 38 kg (83 lb) depending upon configuration

Integrated functions:
- IBM XA-32™ Chipset with integrated memory, I/O controller, and remote I/O controller.
- Service processor with support for Remote Supervisor Adapter II
- Light Path Diagnostics
- LSI Ultra320 SCSI controller with RAID level-1 capability
- Two Broadcom 1GB Ethernet controllers with Wake on LAN® and Alert Standard Format support
- Three universal serial bus (USB) ports
- RXE Expansion Port
- RXE Management Port
- Serial port
- Keyboard port
- Mouse port
- SCSI port

Remote Supervisor Adapter II:
- ATI Radeon RV-100 video controller
- ASM port
- Ethernet port
- Serial port
- Video port

Acoustical noise emissions:
- Sound power, idling: 6.6 bel maximum
- Sound power, operating: 6.6 bel maximum
- Sound pressure, operating: 50 dBa maximum

Environment:
- Air temperature:
  - Server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (3000 ft)
  - Server on: 10° to 32°C (50° to 89.6°F). Altitude: 914 m (3000 ft) to 2133 m (7000 ft)
  - Server off: 10° to 43°C (50° to 110°F). Maximum altitude: 2133 m (7000 ft)
- Humidity:
  - Server on: 8% to 80%
  - Server off: 8% to 80%

Heat output:

Approximate heat output in British thermal units (Btu) per hour:
- Minimum configuration: 1262 Btu (0.37 kilowatts)
- Maximum configuration: 4053 Btu (1.188 kilowatts)

Electrical input:
- Sine-wave input (50-60 Hz) required
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA) approximately:
  - Minimum: 0.08 kVA (ac power connected, server off)
  - Minimum: 0.38 kVA (dc power on, server idle)
  - Maximum: 1.2 kVA

Server controls, LEDs, and power

This section describes the controls and light-emitting diodes (LEDs) and how to turn the server on and off.

Front view

The following illustration shows the controls, LEDs, and connectors on the front of the server.

USB port   Operator information panel   CD-ROM activity LED

Hard disk drive filler panel   Hard disk drive status LED   Hard disk drive activity LED   Diskette drive activity LED
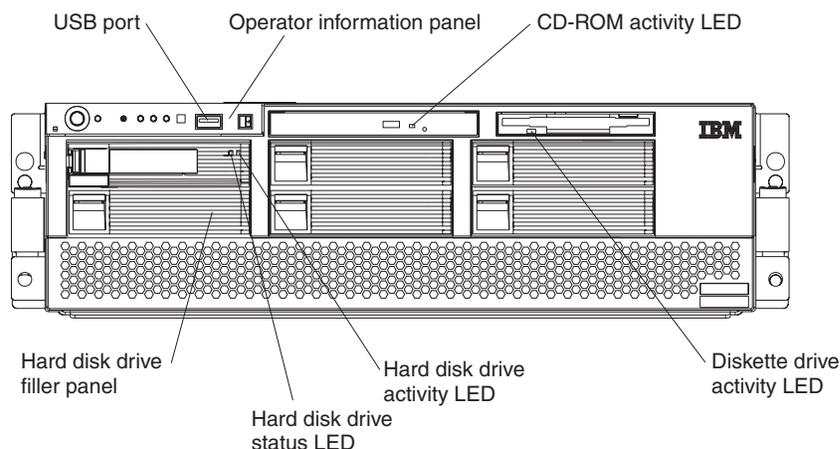
USB port: You can connect a USB device to this connector.

Operator information panel: This panel contains controls, indicators, and a USB port. Swing it open to see the light path diagnostics LEDs on the side surface. Details about the operator information panel are listed below.

Power-on LED   System-error LED

Power-control button   Reset button   USB connector

SCSI activity LED   Information LED

Locator LED   Release latch

Operator information panel	
Power-control button:	Press this button to turn the server on and off manually. A power-control-button shield comes with your server. You can install this disk-shaped shield to prevent the server from being turned off accidentally.
Power-on LED:	When this LED is lit and not flashing, it indicates that the server is turned on. When this LED is flashing, it indicates that the server is turned off and still connected to an ac power source. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed. A power LED is also on the rear of the server. **Note:** If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cord from the electrical outlet.

Operator information panel	
Reset button:	Press this button to reset the server and run the power-on self-test (POST). You might have to use a pen or the end of a straightened paper clip to press the button.
System-error LED:	When this LED is lit, it indicates that a system error has occurred. An LED on the diagnostic LED panel on the side of the operator information panel is also lit to help isolate the error (see "Light path diagnostics" on page 18).
USB connector:	You can connect a USB device to this connector.
Release latch:	Press this latch to release the operator information panel to access the light path diagnostics LED panel.
Information LED:	When this LED is lit, it indicates that a noncritical event has occurred (see "Light path diagnostics" on page 18).
Locator LED:	Use this blue LED to visually locate the server if it is in a location with numerous other servers. A locator LED is also on the rear of the server. You can use the Management Processor Assistant (MPA) in IBM Director to cause this LED to be lit, off, or flashing (see the *User's Guide* on the IBM *xSeries Documentation* CD for more information). If the server is connected to an RXE-100 Remote Expansion Enclosure, pressing the Locate button on the enclosure causes this LED to be lit. **Note:** This LED flashes while the server is being turned on or restarted, and turns off when POST is complete.
SCSI activity LED:	When this LED is lit, it indicates that there is activity on the SCSI bus.

CD-ROM drive activity LED: When this LED is lit, it indicates that the CD-ROM drive is in use.

Diskette drive activity LED: When this LED is lit, it indicates that the diskette drive is in use.

Hard disk drive activity LED: When this LED is flashing, it indicates that the associated hard disk drive is in use.

Hard disk drive status LED: When this LED is lit continuously, it indicates that the associated hard disk drive has failed. The interpretation of a flashing status LED depends on the SCSI controller that is connected to the hot-swap drive, as follows:
- When the drive is connected to the integrated SCSI controller with RAID capabilities, a flashing status LED indicates that the drive is a secondary drive in a mirrored pair and the drive is being synchronized.
- When the drive is connected to an optional ServeRAID™ controller, a slowly flashing (one flash per second) status LED indicates that the drive is being rebuilt. When the LED is flashing rapidly (three flashes per second), it indicates that the controller is identifying the drive.

Hard disk drive filler panels: A filler panel and air baffle is used to cover empty hard disk drive bays. A filler panel and air baffle must be installed in each empty bay to ensure proper system cooling. Your server comes with five filler panels and air baffles installed, and one completely empty bay.

Rear view

The following illustration shows the LEDs on the rear of the server.
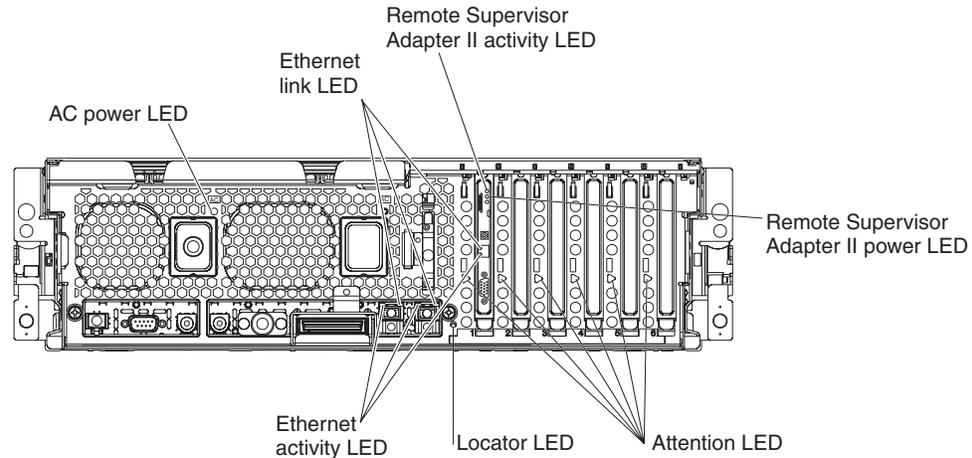
AC power LED: Each hot-swap power supply has an ac power LED that is visible from the rear of the server. The power supply also has an ac power LED and a dc power LED on the top of the power supply, visible when the server cover is removed. When the ac power LED is lit, ac input to the power module is present and within specifications. During typical operation, both the ac and dc power LEDs on the top of the power supply are lit. For any other combination of LEDs, see "Power LED errors" on page 130.

Ethernet link LEDs: When these LEDs (one for the Remote Supervisor Adapter II, two for the network) are lit, they indicate that the related Ethernet link is operational.

Remote Supervisor Adapter II activity LED: When this LED is flashing, the Remote Supervisor Adapter II is functioning normally. When the LED is lit continuously, there is a problem with the Remote Supervisor Adapter II. When the LED is off, the Remote Supervisor Adapter II is not functioning.

Remote Supervisor Adapter II power LED: When this LED is lit, it indicates that power is being supplied to the Remote Supervisor Adapter II.

Attention LED: When this LED is on steady, it indicates that the adapter in the corresponding slot is ready to be removed (hot-pluggable adapter only) or there is a problem with the adapter. When this LED is flashing, it indicates that an operation is in progress or that the adapter requires attention, depending on the operating system.

Locator LED: Use this blue LED to visually locate the server if it is in a location with numerous other servers. A locator LED is also on the operation information panel on the front of the server. You can use the Management Processor Assistant (MPA) in IBM Director to cause this LED to be lit, off, or flashing (see the *User's Guide* on the IBM *xSeries Documentation* CD for more information on IBM Director). If the server is connected to an RXE-100 Remote Expansion Enclosure, pressing the Locate button on the enclosure causes this LED to be lit.

Note: This LED flashes while the server is being turned on or restarted, and turns off when POST is complete.

Ethernet activity LEDs: When these LEDs (one for the Remote Supervisor Adapter II, two for the network) are lit, they indicate that activity is taking place on the related network.

The following illustration shows the connectors on the rear of the server.
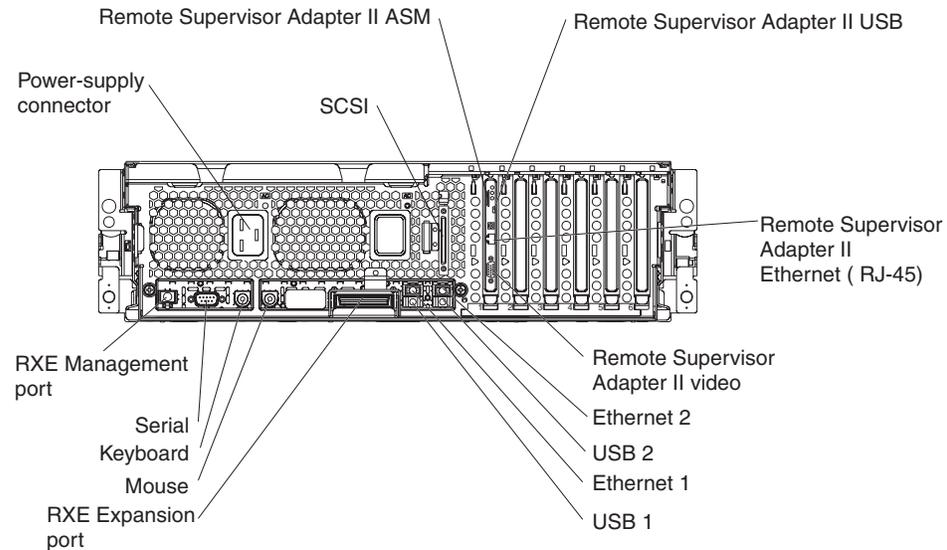
Remote Supervisor Adapter II ASM connector: Attach an ASM breakout cable to this connector to enable system management through the serial connectors and through the ASM RS-485 connectors.

Remote Supervisor Adapter II USB connector: This connector is not available for use.

Remote Supervisor Adapter II Ethernet connector: Use this connector to connect the Remote Supervisor Adapter II to a network to manage the server from a remote location.

To enable remote server management through a network, use the Remote Supervisor Adapter II Ethernet port. To enable remote server management using a modem, use the Remote Supervisor Adapter II serial connector on the breakout cable. To connect the server with another server, use the Remote Supervisor Adapter II ASM interconnect connector.

Remote Supervisor Adapter II video connector: Connect the server monitor to this connector.

Note: The external power connection on the Remote Supervisor Adapter II is not supported on the xSeries 365 server.

Ethernet connectors: Use these connectors to connect the server to a network.

USB connectors: Connect USB devices to these connectors.

RXE Expansion port: Use this connector to connect the server to a remote I/O enclosure. This port enables the exchange of data between the server and the enclosure (see "RXE Expansion Port connector" on page 64).

Mouse connector: Connect a mouse or other pointing device to this connector.

Keyboard connector: Connect a PS/2 (non-USB) keyboard to this connector.

Serial connector: Connect a serial device to this connector.

RXE Management Port: Connect the RXE Management A (In) Port of an optional IBM RXE-100 Remote Expansion Enclosure to this connector (see "RXE connector cabling" on page 60).

Power-supply connector: Connect one end of the power-supply power cord to this connector and connect the other end to an ac power source. The server comes with one or two hot-swap power supplies, depending on the configuration. You can add a second hot-swap power supply to obtain full power redundancy. Connect each power supply to an ac power source for power redundancy.

SCSI connector: Connect an external SCSI device to this connector.

Light path diagnostics LED panel

Swing the operator information panel out to see the light path diagnostics LED panel on the side surface (see "Light path diagnostics" on page 18 and "Light path LED errors" on page 93).

Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic except for the service processor is shut down; however, the server can respond to requests from the service processor, such as a remote request to turn on the server. The power-on LED flashes to indicate that the server is connected to ac power but not turned on.

Turning on the server

Approximately 20 seconds after the server is connected to ac power, the power-control button becomes active, and you can turn on the server and start the operating system by pressing the power-control button.

The server can also be turned on in any of the following ways:

- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with a Remote Supervisor Adapter or Remote Supervisor Adapter II installed, the server can be turned on from the Remote Supervisor Adapter or Remote Supervisor Adapter II user interface.
- The system-management software for the Remote Supervisor Adapter II in your server can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

Note: When 4 GB or more of memory (physical or logical) is installed, some memory is reserved for various system resources and is unavailable to the operating system. The amount of memory that is reserved for system resources depends on the operating system, the configuration of the server, and the configured PCI options.

Turning off the server

When you turn off the server and leave it connected to ac power, the server can respond to requests from the service processor, such as a remote request to turn on the server. To remove all power from the server, you must disconnect it from the power source.

Note: Under some conditions, the two rear fans in front of the power supplies will be operating when the server is turned off and connected to ac power. This enables the power supplies to be cooled when they are generating power for standby functions.

Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

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.

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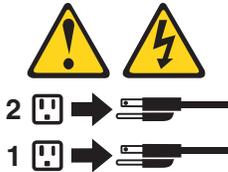
The server can be turned off in any of the following ways:

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 5 seconds to turn off the server.
- The server can be turned off from the server Remote Supervisor Adapter II user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The service processor can turn off the server as an automatic response to a critical system failure.
- You can turn off the server through a request from the service processor.

Chapter 2. Configuring the server

The following configuration programs and capabilities come with your server:

- Configuration/Setup Utility program
- IBM *ServerGuide™ Setup and Installation* CD
- Preboot Execution Environment (PXE) boot agent utility program
- RAID configuration programs
  - LSI Logic Configuration utility program
  - ServeRAID Manager
- Service processor firmware update utility
- Gigabit Ethernet controller configuration process
- Remote Supervisor Adapter II configuration process

Detailed information about these configuration programs is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Using the Configuration/Setup Utility program

The Configuration/Setup Utility program is part of the BIOS code. You can use it to:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords
- Set the startup characteristics of the server and the order of startup devices
- Set and change settings for advanced hardware features
- View and clear error logs
- Change interrupt request (IRQ) settings
- Enable USB legacy keyboard and mouse support
- Resolve configuration conflicts

Complete the following steps to start the Configuration/Setup Utility program:

1. Turn on the server.
2. When the prompt `Press F1 for Configuration/Setup` appears, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu. If you do not type the administrator password, a limited Configuration/Setup Utility menu is available.
3. Select settings to view or change.

Detailed information about the Configuration/Setup and Utility program is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD includes an easy-to-use setup and installation program that is designed for your IBM server. The ServerGuide program detects the server model and hardware options that are installed and uses that information during setup to configure the hardware. The ServerGuide program simplifies operating-system installations by providing updated device drivers and, in some cases, installing them automatically.

Note: The ServerGuide program works only with 32-bit Windows® operating systems.

When you start the *ServerGuide Setup and Installation* CD, the program prompts you to complete the following tasks:

* Select your language.
* Select your keyboard layout and country.
* View the overview to learn about ServerGuide features.
* View the readme file to review installation tips for your operating system and adapter.
* Start the operating-system installation. You will need your operating-system CD.

Detailed information about using ServerGuide is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Using the PXE boot agent utility program

Use the Preboot Execution Environment (PXE) boot agent utility program to enable or disable operating-system wake-up support.

Note: The server does not support changing the network boot protocol or specifying the startup order of devices through the PXE boot agent utility program.

Complete the following steps to start the PXE boot agent utility program:

1. Turn on the server.
2. When the `Broadcom NetXtreme Ethernet Boot Agent V6.1.3` prompt appears, press Ctrl+S. You have 2 seconds (by default) to press Ctrl+S after the prompt appears.

    Note: If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to set the Ethernet PXE startup option.
3. Use the arrow keys and press Enter to select a choice from the menu.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

Detailed information about using the PXE boot agent utility program is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Using the RAID configuration programs

Use the LSI Logic Configuration Utility program and ServeRAID Manager to configure and manage redundant array of independent disks (RAID) arrays. Be sure to use these programs as described in the *User's Guide*.

- Use the LSI Logic Configuration Utility program to:
  - Perform a low-level format on a SCSI hard disk drive
  - View or change SCSI IDs for attached devices
  - Set SCSI protocol parameters on SCSI hard disk drives
- Use ServeRAID Manager to:
  - Configure arrays
  - View your RAID configuration and associated devices
  - Monitor operation of your RAID controllers

Detailed information about using the RAID configuration programs is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Updating the integrated service processor firmware

To update only the firmware for the Remote Supervisor Adapter II and the integrated service processor, download the firmware update package for the server from the IBM Support Web site at http://www.ibm.com/pc/support/ and follow the instructions in the text file on the Web site.

To update the server BIOS, device drivers, and other firmware including the firmware for the Remote Supervisor Adapter II and integrated service processor, download and apply the system service package for the server. Detailed information is available in the *User's Guide* on the IBM *xSeries Documentation* CD.

Configuring the Gigabit Ethernet controllers

The Ethernet controllers are integrated on the I/O board. They provide an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provide full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet ports in your server support auto-negotiation, the controllers detect the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operate at that rate and mode.

You do not need to set any jumpers or configure the controllers. However, you must install a device driver to enable the operating system to address the controllers. For device drivers and information about configuring the Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software CD* that comes with your server. For updated information about configuring the controllers, go to http://www.ibm.com/pc/support/.

Remote Supervisor Adapter II

The Remote Supervisor Adapter II can be used on an Advanced System Management (ASM) network so that you can manage the server remotely.

For more information about how to configure and use an ASM network to manage the server remotely through the Web-based interface or the text-based interface, see the *User's Guide* and the *IBM Remote Supervisor Adapter II User's Guide*, both of which can be found on the IBM *xSeries Documentation* CD.

Chapter 3. Diagnostics

This chapter provides basic troubleshooting information to help solve some common problems that might occur with the server.

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, "Getting help and technical assistance," on page 145 for more information.

General checkout

Follow the checkout procedure for diagnosing hardware problems. Review the following information before performing the checkout procedure:

- Read the safety information beginning on page 147.
- The diagnostics programs provide the primary methods of testing the major components of the server, including the I/O board, Ethernet controller, RAM, keyboard, mouse (pointing device), serial ports, hard disk drives, and parallel port. You can also use them to test some external devices. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostics programs to confirm that the hardware is working correctly. The diagnostic programs (see "Starting the diagnostic programs" on page 23) are in the system flash erasable programmable read-only memory (EPROM) on the I/O board.
- When you run the diagnostics programs, a single problem might cause several error messages. If you receive several error messages, correct the cause of the first error message. The other error messages might not occur the next time you run the diagnostics programs.
- Before running the diagnostics programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If you suspect that it is part of a cluster, you can run all diagnostics programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing server might be part of a cluster if any of the following conditions is true:
  - The customer identifies the failing server as part of a cluster.
  - One or more external storage units are attached to the failing server and at least one of the attached storage units is also attached to another server or unidentifiable device.
  - One or more servers are located near the failing server.
- **Important:**
  1. When testing a server that is part of a shared hard disk drive cluster, run only one test at a time, in looped mode. Do not run all tests in looped mode, because the hard disk drive tests might run.
  2. If more than one error code is displayed, correct the first error. The other error codes might not occur the next time you run the diagnostics programs.
  3. If the server is suspended and a POST error code is displayed, see "POST error logs" on page 17.
  4. If the server is suspended and no error message is displayed, see "Error symptoms" on page 121 and "Undetermined problems" on page 136.
  5. For information about power-supply problems, see "Power checkout" on page 27.

6. For intermittent problems, check the error log; see "POST error logs" on page 17 and "Diagnostic programs and error messages" on page 22.

Complete the following steps to perform the checkout procedure:

001 **IS THE SERVER PART OF A CLUSTER?**

YES. Schedule maintenance for the server. Shut down all servers related to the cluster. Run the storage test.

NO. Go to step **002** .

002 **IF THE SYSTEM IS NOT PART OF A CLUSTER:**

If the operating system is running, complete the following steps:
1. Check the light path (see "Light path diagnostics" on page 18).
2. Check the service processor system-error logs:
    a. If the system-error log indicates a damaged field replaceable unit (FRU), replace the FRU, and run diagnostics to confirm that the problem has been solved.
    b. If the system-error log does not indicate a damaged FRU, see "Error symptoms" on page 121 and "Undetermined problems" on page 136.

If the operating system is not running, complete the following steps:
1. Check the light path (see "Light path diagnostics" on page 18).
2. Check the service processor system-error logs.
    a. If the error log indicates a damaged field replaceable unit (FRU), replace the FRU, and run diagnostics to confirm that the problem has been solved.
    b. If the error log does not indicate a damaged FRU, check the operating-system event logs; if these logs do not specify a particular error, go to step 3.
3. Turn off the server and all external devices.
4. Check all cables and power cords.
5. Set all display controls to the middle position.
6. Turn on all external devices.
7. Turn on the server.
8. Watch the screen and the serial port for POST errors, and record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error (see "POST error codes" on page 88).
9. Run diagnostics (see "Starting the diagnostic programs" on page 23).

003 **DID THE DIAGNOSTIC PROGRAM START?**

NO. Find the failure symptom in "Error symptoms" on page 121.

YES. Run the diagnostic programs. If necessary, see "Diagnostic programs and error messages" on page 22.

If you receive an error, see Chapter 6, "Symptom-to-FRU index," on page 85.

If the diagnostic programs were completed successfully and you still suspect a problem, see "Undetermined problems" on page 136.

If the server does not turn on, see "Error symptoms" on page 121.

Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST beep codes, error messages, and error logs**

  The power-on self-test (POST) generates beep codes and messages to indicate successful test completion or the detection of a problem. See "POST error logs" for more information.

- **Light path diagnostics feature**

  Use the light path diagnostics feature to identify system errors quickly. See "Light path diagnostics" on page 18 for more information.

- **Diagnostic programs and error messages**

  The diagnostic programs are stored in the system flash EPROM on the I/O board. These programs are the primary method of testing the major components of the server. See "Diagnostic programs and error messages" on page 22 for more information.

POST error logs

When you turn on the server, it performs a series of tests to check the operation of server components and some of the options installed in the server. This series of tests is called the power-on self-test, or POST.

If POST finishes without detecting any problems, a single beep sounds, and the first screen of the operating system opens or an application program starts.

If POST detects a problem, more than one beep might sound, or an error message appears on the screen. See "Beep symptoms" on page 86 and "POST error codes" on page 88 for more information.

Notes:

1. If a power-on password is set, you must type the password and press Enter, when prompted, before POST will continue.

2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

The POST error log contains the three most recent error codes and messages that were generated during POST. The system-error log contains all messages that were generated during POST and all system status messages from the service processor.

You can view the contents of the system-error log from the Configuration/Setup Utility program or from the diagnostic programs.

Note: When troubleshooting PCI-X slots, you will notice that the error logs report the PCI-X buses numerically. The numerical assignment will change depending on your configuration.

Viewing error logs from the Configuration/Setup Utility program

Start the Configuration/Setup Utility program; then, select **Error Logs** from the main menu. See "Using the Configuration/Setup Utility program" on page 11 for more information.

Viewing error logs from the diagnostic programs

Start the diagnostic programs; select **Hardware Info** from the top of the diagnostic programs screen; select **System Error Log** from the list that appears; then, follow the instructions on the screen. See "Starting the diagnostic programs" on page 23 for more information.

Light path diagnostics

Many errors are first indicated by the illumination of the information LED or system-error LED in the operator information panel on the front of the server. If one or both of these lights are lit, one or more lights elsewhere in the server might also be lit and can direct you to the source of the error.

This light path diagnostics feature provides a path that you can follow in three phases to help identify the source of an error. The lights are designed to be followed in an orderly progression, depending on the error.

Note: Read "Safety information" on page 147 and "Handling static-sensitive devices" on page 30.

The lights are viewed in the following order:

1. Begin on the front panel by checking the operator information panel.
   * The information LED indicates that information concerning a sub-optimal condition in the server is available in the system-error log.
   * The system-error LED indicates that an error has occurred.

   If the system-error LED on this panel is lit, go to step 2.
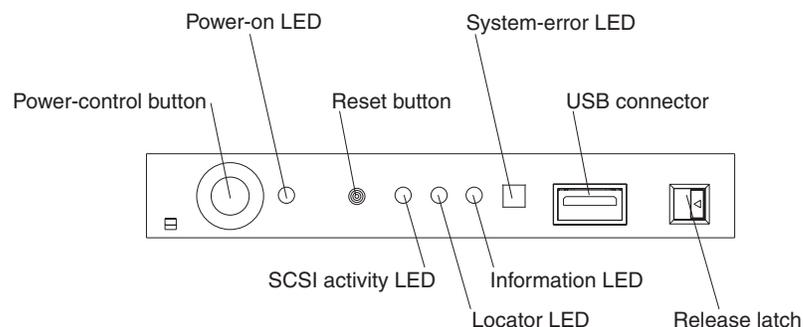
Note: The LEDs and connectors on the operator information panel are described in "Front view" on page 4.

2. Open the operator information panel by pressing the release latch to swing the panel out and reveal the light path diagnostics panel. Lit LEDs on this panel indicate the type of error that has occurred.
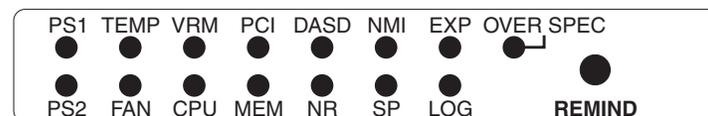
Then, check the system service label. This label gives an overview of internal components that correspond to the LEDs on the light path diagnostics panel. This information, combined with the information in the table "Light path LED errors" on page 93, can often provide enough information to correct the indicated error.

3. Look inside the server, if necessary. Certain components inside the server have LEDs that will be lit to indicate the location of a problem. For example, a VRM error will light the LED next to the failing VRM on the microprocessor tray assembly.

Light path diagnostics LEDs for DIMMs and fans must be viewed from inside the server and will not be lit unless the serv.er is connected to a power source, although the server does not have to be turned on to view these LED. The LEDs for microprocessors and VRMs are viewed by removing the microprocessor-tray assembly. The following sections describe the procedures to follow to view the LEDs on the microprocessor-tray assembly and memory board.

Microprocessor LEDs

Complete the following steps to view the microprocessor LEDs:

1. Turn off the server and any peripheral devices; then, disconnect all external cables from the server.

2. Slide the server out of the rack cabinet.

3. Remove the fans (see "Replacing a hot-swap fan" on page 55) and memory cassette (see step 4 on page 46).

4. Remove the microprocessor tray:

   a. Lift the microprocessor-tray release latch (see "Installing a microprocessor" on page 44).

   b. Open the microprocessor-tray levers.

   c. Pull out the microprocessor tray.
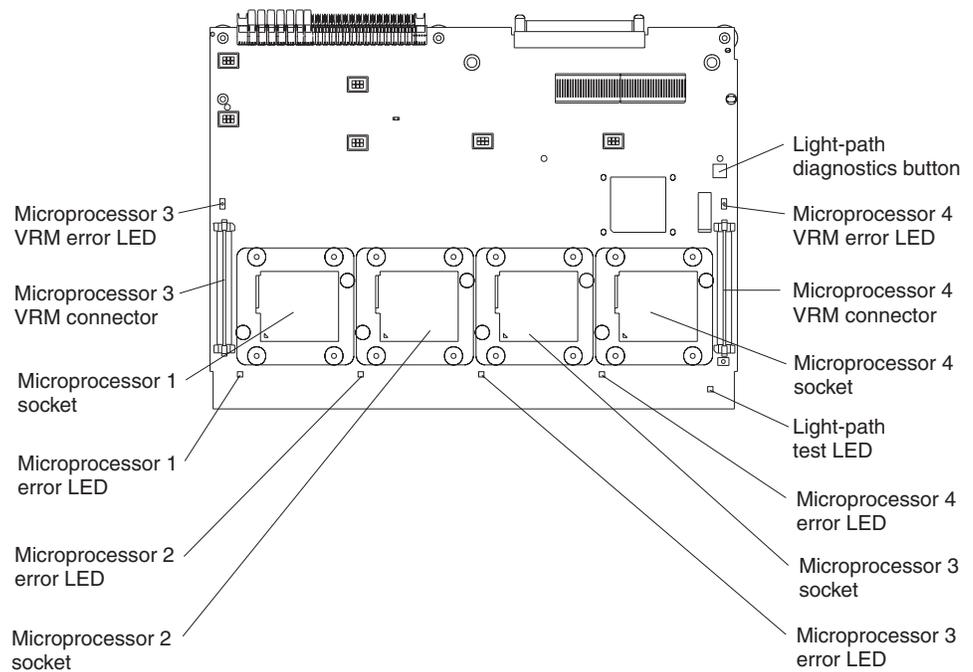
5. Press and hold down the light-path diagnostics button on the microprocessor board. The LEDs will be lit while the button is pressed. You can light the LEDs for a maximum of 2 minutes, after which power is no longer available for the LEDs.

   Note: You can press the light-path diagnostics button to relight the light path diagnostics LEDs that are lit on the microprocessor tray without ac

power. After ac power has been removed from the server, power remains available to these LEDs for up to 12 hours. After 12 hours, you must reinstall the microprocessor tray and turn on the server to supply power to the LEDs.

To reinstall the microprocessor tray, reverse the preceding steps.

DIMM LEDs

Complete the following steps to view the DIMM LEDs:

Note: The lit LEDs light the connector retaining clips; look for a lit retaining clip to locate a failed DIMM.

1. Turn off the server and all peripheral devices.
2. Slide the server out of the rack cabinet.
3. Open the top cover.
   a. The following illustration shows the internal connectors and LEDs on the 8-DIMM-connector memory board in the memory cassette.
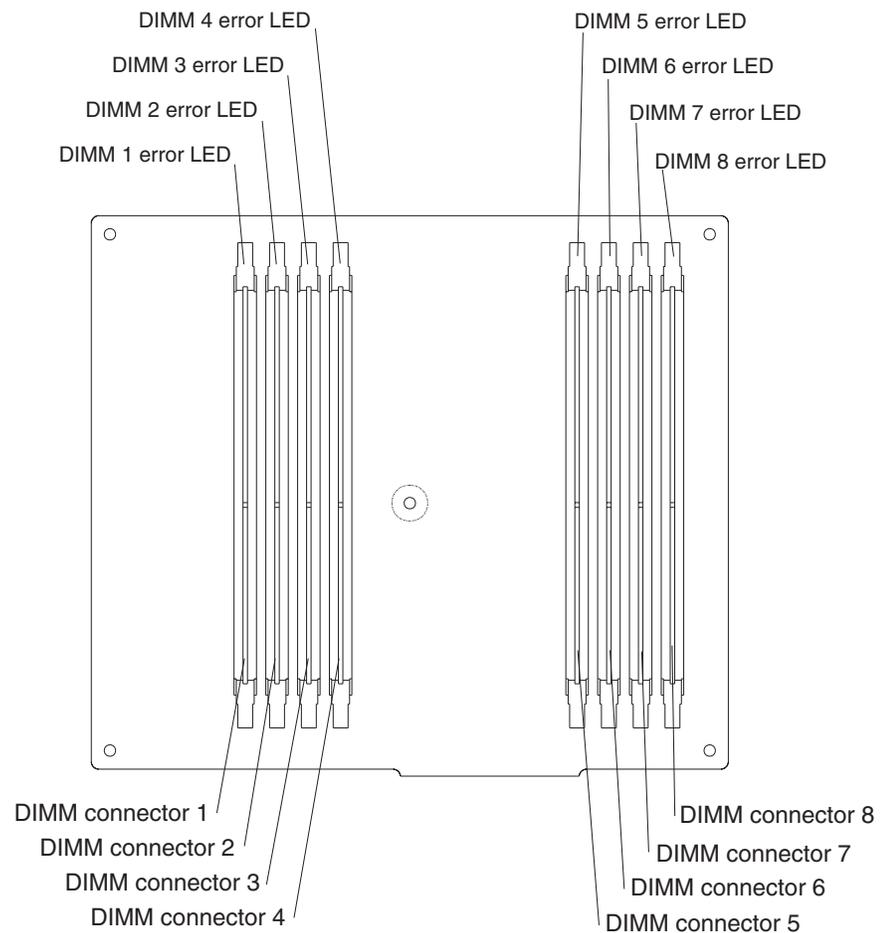
b. The following illustration shows the internal connectors and LEDs on the 16-DIMM-connector memory board in the memory cassette.

DIMM 8 error LED
DIMM 7 error LED
DIMM 6 error LED
DIMM 5 error LED
DIMM 4 error LED
DIMM 3 error LED
DIMM 2 error LED
DIMM 1 error LED

DIMM 9 error LED
DIMM 10 error LED
DIMM 11 error LED
DIMM 12 error LED
DIMM 13 error LED
DIMM 14 error LED
DIMM 15 error LED
DIMM 16 error LED

DIMM connector 1
DIMM connector 2
DIMM connector 3
DIMM connector 4
DIMM connector 5
DIMM connector 6
DIMM connector 7
DIMM connector 8

DIMM connector 16
DIMM connector 15
DIMM connector 14
DIMM connector 13
DIMM connector 12
DIMM connector 11
DIMM connector 10
DIMM connector 9

4. If necessary, open the DIMM access doors on the memory cassette to view the DIMM LEDs.

Remind button

You can use the remind button to place the system-error LED on the front panel into the remind mode (flashes every 2 seconds). By pressing this button, you acknowledge the failure but indicate that you will not take immediate action. If a new failure occurs, the system-error LED is lit again.

The system-error LED stays in remind mode until one of the following conditions occurs:
* All known problems are solved.
* The server is restarted.

- A new problem occurs.

You can use the remind button to delay server maintenance until a later time.

Diagnostic programs and error messages

The diagnostic programs are in the system flash erasable programmable read-only memory (EPROM) on the I/O board. These programs are the primary method of testing the major components of the server.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems that are indicated by error messages should be performed by trained service personnel.

Sometimes the first error to occur causes additional errors. In this case, the server displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

Diagnostic text messages

While a test is running, the name of the test is displayed on the screen. If the test detects an error or is abnormally ended, a message is displayed to indicate the reason that the test stopped. The message is in the following form:

result test_specific_string

where:

result   is one of the following results:

Passed
This test was completed without any errors.

Failed
This test discovered an error.

User Aborted
You stopped the test before it was completed.

Not Applicable
You attempted to test a device that is not present in the server.

Aborted
The test could not proceed because of the server configuration.

Warning
A possible problem was reported during the test (for example, a device that was to be tested is not installed).

test specific string
is an error code or other information about the error.

Starting the diagnostic programs

This section describes the general procedure to run the diagnostic programs.

You can press F1 while running the diagnostic programs to obtain help information. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from help, press Esc.

Complete the following steps to start the diagnostic programs:

1. Turn on the server and watch the screen.
2. When the message `Press F1 for Configuration/Setup`, `Press F2 for Diagnostics` appears, press F2.

   If a power-on password is set, the server prompts you for it. Type the power-on password, and press Enter.
3. When the Diagnostic Programs screen appears, select either **Extended** or **Basic** from the top of the screen.
4. Select the test you want to run from the list that appears; then, follow the instructions on the screen.

   Notes:

   a. If the server stops during testing and you cannot continue, restart the server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the server stopped.

   b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the server.

   c. If you run the diagnostic programs with no mouse attached to the server, you will not be able to navigate between test categories using the **Next Cat** and **Prev Cat** buttons. All other functions provided by mouse-selectable buttons are also available using the function keys.

   d. You can test the USB keyboard by using the regular keyboard test. The regular mouse test can test a USB mouse. You can run the USB interface test only if there are no USB devices attached.

   e. You can view server configuration information (such as system configuration, memory contents, interrupt request (IRQ) use, direct memory access (DMA) use, device drivers, and so on) by selecting **Hardware Info** from the top of the screen.

If the diagnostic programs do not detect any hardware error but the problem remains during normal server operations, a software error might be the cause. If you suspect a software problem, see the information that comes with the software package.

Diagnostic error codes are listed in "Diagnostic error codes" on page 95.

Viewing the test log

When the tests are completed, you can view the test log by selecting **Utility** from the top of the screen and then selecting **View Test Log**.

Notes:

1. You can view the test log only while you are in the diagnostic programs. When you exit the diagnostic programs, the test log is cleared (saved test logs are not affected). To save the test log so that you can view it later, click **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.

2. To save the test log to a diskette, you must use a diskette that you have formatted yourself; this function does not work with preformatted diskettes. If the diskette has sufficient space for the test log, the diskette may contain other data.

Viewing the system-error log

You can also view the system-error log from the diagnostic programs. See the instructions in "POST error logs" on page 17.

Recovering BIOS code

If the BIOS code in the server has become damaged, such as from a power failure during a flash update, you can recover the BIOS using the recovery boot block and a BIOS flash diskette. You can download a BIOS flash diskette from http://www.ibm.com/pc/support/.

The flash memory of the server consists of a primary page and a backup page. The J19 jumper on the I/O board controls which page is used to start the server. If the BIOS code in the primary page is damaged, you can use the backup page to start the server; then start the BIOS flash diskette to restore the BIOS code to the primary page.

To recover the BIOS code, complete the following steps:
1. Read "Safety information" on page 147 and "Handling static-sensitive devices" on page 30.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover.
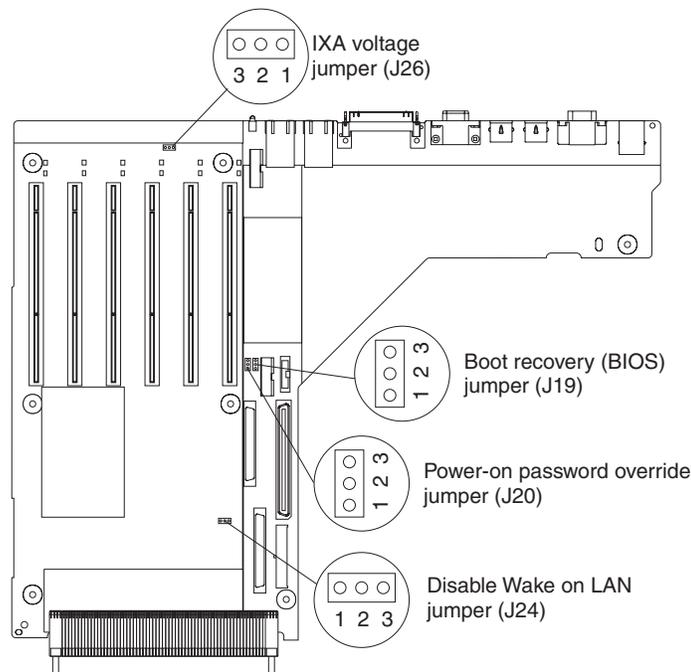
3. Locate the boot block recovery jumper (J19 on the I/O board).
4. Move J19 to pins 2 and 3 to enable secondary boot block page.
5. Insert the BIOS flash diskette into the diskette drive.
6. Restart the server.

7. POST starts. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.

8. When you are asked whether you want to move the current POST/BIOS image to the backup ROM location, type N.

    Attention: Typing Y will copy the damaged BIOS code into the secondary page.

9. When you are asked whether you would like to save the current code to a diskette, select N.

10. Type 1 and press Enter to continue.

    Attention: Do not restart or power off the server until the update is completed.

11. Turn off the server.

12. Move jumper J19 back to pins 1 and 2 to return to normal startup mode.

13. Replace the cover; then, restart the server.

Password override jumper

Change the position of the password override jumper by using the following procedure:

1. Read "Safety information" on page 147 and "Handling static-sensitive devices" on page 30.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover.
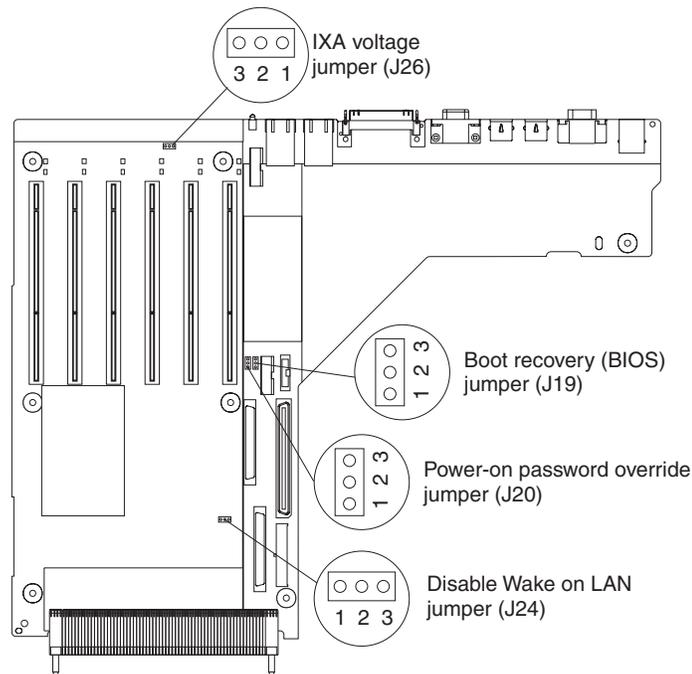
3. Locate the power-on password override jumper (J20), removing any components that impede access to the jumper.

    Note: You might have to remove the Remote Supervisor Adapter II to access the jumper.

4. Move the jumper from pins 1 and 2 (default) to pins 2 and 3.

5. Reinstall the cover and reconnect the external cables and power cords; then, turn on the server and access the Configuration/Setup Utility menu to change the power-on password.

6. Repeat steps 2 on page 25 and 3 on page 25; then, move the jumper back to pins 1 and 2.

7. Reinstall any components that were removed in step 3 on page 25; then, reinstall the cover and reconnect the external cables and power cord.

Changing the position of this jumper does not affect the administrator password check if an administrator password is set.

Attention: If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the operator information panel.

Forcing a power-on

Complete the following steps to turn on the server without pressing the power-on button:

1. Read "Safety information" on page 147 and "Handling static-sensitive devices" on page 30.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove hot-swap fan number 2 (see "Replacing a hot-swap fan" on page 55).
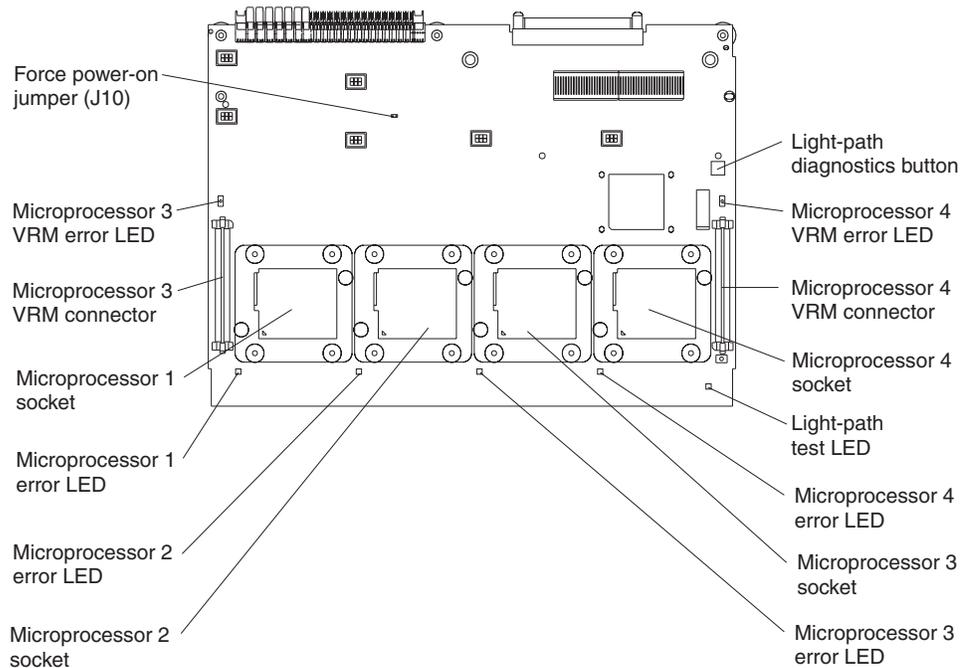
3. Locate the force power-on jumper (J10), and place a jumper over the two pins.

4. Reinsert the microprocessor tray assembly fully into the server and reconnect the cables and power cords. The server will turn on.

5. To return the jumper to its default position, repeat step 2; then, remove the jumper from J10.

6. Reinsert the microprocessor tray assembly fully into the server and reconnect the cables and power cords.

Power checkout

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually a short circuit will cause the power subsystem to shut down because of an overcurrent condition. A general procedure for troubleshooting power problems is as follows:

1. Turn off the server and disconnect all ac power cords.
2. Check for loose cables in the power subsystem. Also check for short circuits, for example, if there is a loose screw causing a short circuit on a circuit board.
3. Remove adapters and disconnect the cables and power connectors to all internal and external devices until the server is at the minimum configuration required to start the server (see "Minimum operating requirements" on page 136).
4. Reconnect all ac power cords and turn on the server. If the server starts up successfully, replace adapters and devices one at a time until the problem is isolated.

If the server does not start up from the minimal configuration, replace FRUs of minimal configuration one at a time until the problem is isolated.

To use this method, it is important to know the minimum configuration required for a system to start (see "Minimum operating requirements" on page 136). For specific problems, see "Power LED errors" on page 130.

Ethernet controller troubleshooting

The method of testing the Ethernet controller depends on which operating system is being used (see the Ethernet controller device driver readme file).

If the problem remains after you check the operating system documentation, try the following:
- Make sure that the Ethernet cable is installed correctly.

  The network cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.

  If you set the Ethernet controller to operate at 100 Mbps, you must use Category 5 cabling.

  If you directly connect two systems (without a hub), or if you are not using a hub with X ports, use a crossover cable.

  Note: To determine whether a hub has an X port, check the port label. If the label contains an X, the hub has an X port.
- Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Check the Ethernet controller LEDs on the server rear panel. These LEDs indicate whether a problem exists with the connector, cable, or hub.
  - The Ethernet Link Status LED is lit when the Ethernet controller receives a LINK pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
  - The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet Network. If the Ethernet Transmit/Receive Activity light is off, make sure that the hub and network are operating and that the correct device drivers are loaded.

- Check the LAN activity LED on the rear of the server. The LAN activity LED is lit when data is active on the Ethernet network. If the LAN activity LED is off, make sure that the hub and network are operating and that the correct device drivers are loaded.
- Make sure that you are using the correct device drivers, which come with the server.
- Check for operating-system-specific causes for the problem.
- Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network, inform the network administrator.

Chapter 4. Installing options

This chapter provides basic instructions for installing hardware options in your server. These instructions are intended for users who are experienced with setting up IBM server hardware.

Installation guidelines

Before you begin installing options in your server, read the following information:

- Read "Safety information" on page 147 and "Handling static-sensitive devices" on page 30. This information will help you work safely with your server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- Have a small Phillips screwdriver available.
- Have a small flat-blade screwdriver available.
- You do not need to turn off the server to install or replace hot-swap power supplies, hot-swap fans, or hot-plug Universal Serial Bus (USB) devices.

  Attention: The Remote Supervisor Adapter II is not a hot-swap or hot-plug device.
- The orange color on components and labels identifies hot-swap or hot-plug components. You can install or remove hot-swap and hot-plug components while the server is running, provided that the server is configured to support this capability. See the instructions in this chapter for more information about removing and installing hot-swap and hot-plug components.
- The blue color on components and labels indicates touch points, where a component can be gripped, a latch moved, and so on.
- For a list of supported options for your server, go to http://www.ibm.com/pc/compat/.

System reliability guidelines

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

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. See the documentation that comes with the rack.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.
- You have replaced a hot-swap drive within 2 minutes of removal.
- Microprocessor sockets 2, 3, and 4 each contain either a microprocessor baffle or a microprocessor and heat sink at all times.
- You do not operate the server without the cover for more than two minutes.

Working inside a server with power on

Your server supports hot-swap devices and is designed to operate safely while it is turned on and the cover is removed. Follow these guidelines when you work inside a server that is turned on:

- Avoid wearing loose-fitting clothing on your forearms. Button long-sleeved shirts before working inside the server; do not wear cuff links while you are working inside the server.
- Do not allow your necktie or scarf to hang inside the server.
- Remove jewelry, such as bracelets, necklaces, rings, and loose-fitting wrist watches.
- Remove items from your shirt pocket, such as pens and pencils, that could fall into the server as you lean over it.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the server.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, 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 circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Major components of the xSeries 365 server

The following illustration shows the major components of the xSeries 365 server.

The orange color on components and labels in the server identifies hot-swap or hot-plug components. You can install or remove these components while the system is running, provided that the server is configured to support this function.

The blue color on components and labels indicates touch points where a component can be gripped, a latch moved, and so on.

Note: The illustrations in this document might differ slightly from your hardware.
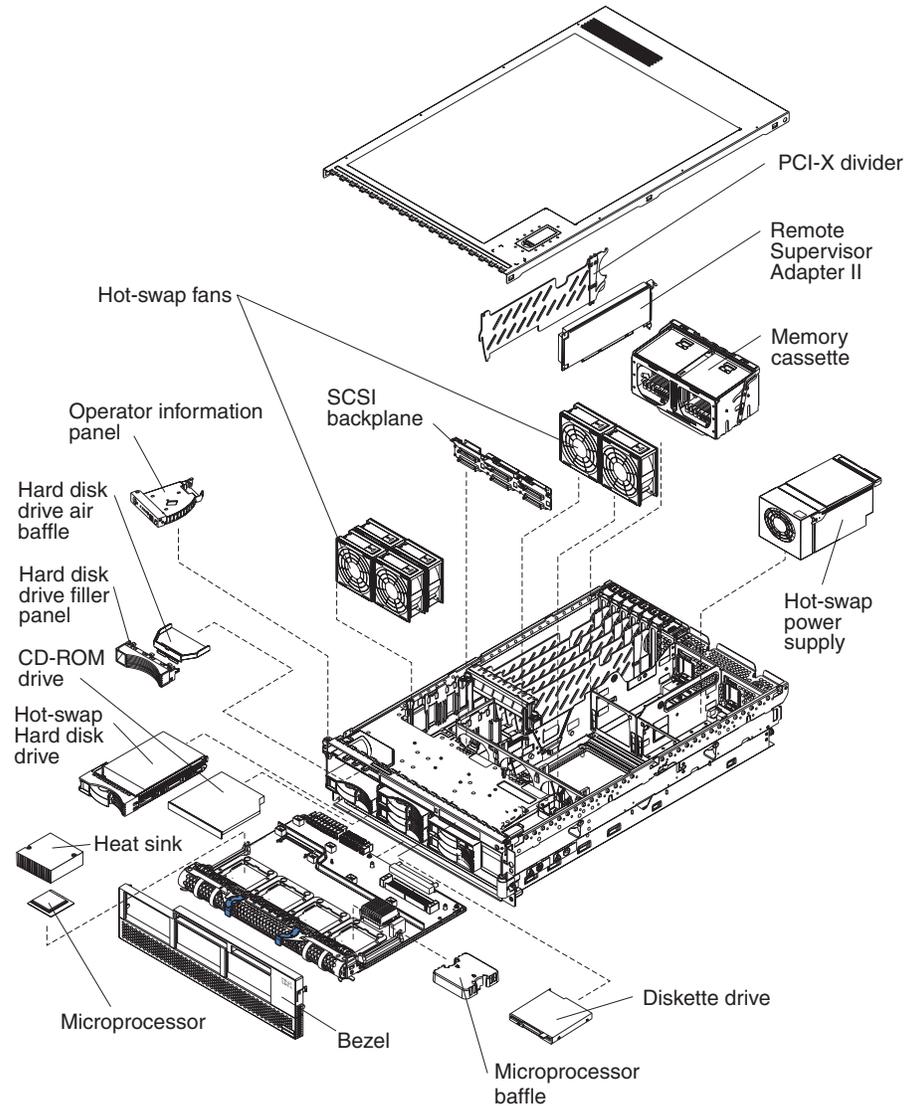
Removing the cover and bezel

Complete the following steps to remove the cover and bezel:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.
2. If you are installing or replacing a non-hot-swap component, turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Slide the server out of the rack until the slide rails lock into place.
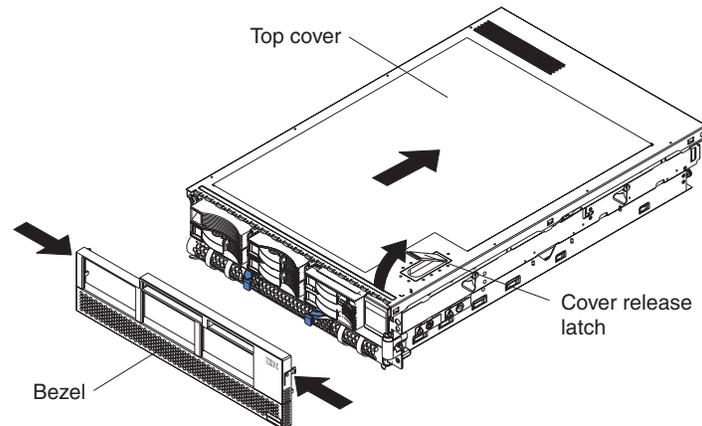
4. Lift the cover-release latch. The cover slides to the rear approximately 13 mm (0.5 inch). Lift the cover off the server.

   Attention: For proper server performance, do not leave the top cover off for more than two minutes while the server is running.
5. Press on the bezel retention tabs at the top edge of the bezel, and pull the top of the bezel slightly away from the server.
6. Lift the bezel up to release the two tabs at the bottom edge of the bezel.

PCI or PCI-X adapters

The following notes describe the types of adapters that your server supports and other information that you must consider when installing a PCI or PCI-X adapter:

- The server supports 3.3 V and universal PCI and PCI-X adapters; it does not support 5.0-V-only adapters.
- The following illustration shows the location and bus speeds of the PCI-X expansion slots on the I/O board.

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

Attention LED

Power LED

PCI slot 1
33 MHz 64-bit

PCI-X slot 2
100 MHz 64-bit

PCI-X slot 3
133 MHz 64-bit

PCI-X slot 4
133 MHz 64-bit

PCI-X slot 5
133 MHz 64-bit

PCI-X slot 6
133 MHz 64-bit

SCSI internal
cable connector (J17)
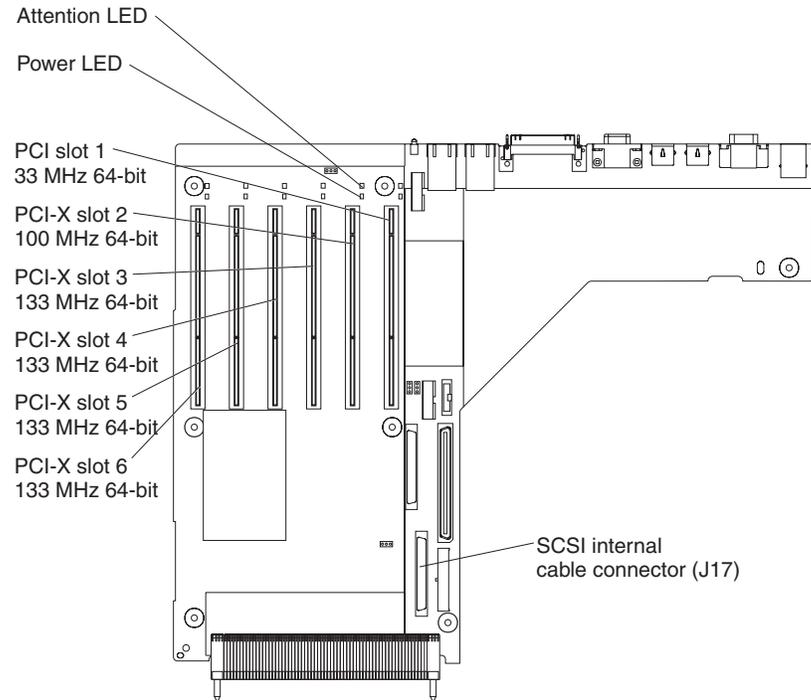
- Each PCI/PCI-X slot is on a separate PCI bus.

Slot number	PCI Bus
1	0
2	3
3	6
4	F (15)
5	C (12)
6	9

- Slot 1 is a PCI slot and is dedicated to the Remote Supervisor Adapter II. The adapter will operate in PCI mode only. The bus speed is 33 MHz only. The adapter is non-hot-swappable; turn off the server when removing and installing the adapter.
- For slots 2 through 6, the bus speed will be set to the speed of the adapter; if a PCI adapter is installed, the bus will run in PCI mode.
- If you install a ServeRAID 6i adapter, it must be installed in slot 2.
- If you install an IXA adapter, it must be installed in slot 3.
- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this chapter.

- If you need to change switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- The server scans devices and PCI-X slots to assign system resources in the following order: CD-ROM drive; disk drives; integrated Ethernet controller; integrated SCSI devices; and PCI-X slots 1, 2, 3, 4, 5, and 6. If an RXE-100 enclosure is attached to the server, the scan continues in sequence with PCI slots 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18.

  Note: You can use the Configuration/Setup Utility program to change the sequence and have the server scan one of the first six PCI slots before it scans the integrated devices. You cannot change the scan sequence of the PCI slots in an RXE-100 enclosure.
- The PCI-X slot numbers in an RXE-100 enclosure are assigned in the following order:

Slots in RXE-100 enclosure	Slot numbers assigned to A side	Slot numbers assigned to B side
6 slots on A side only	7 - 12* (A1 - A6)	none
6 slots on B side only	none	7 - 12* (B1 - B6)
12 slots	7 - 12 (A1 - A6)	13 - 18 (B1 - B6)
* Both sides are numbered 7-12 when an RXE-100 enclosure is shared.		

- If you install a RAID adapter other than a ServeRAID 6i adapter to control internal hot-swap hard disk drives, you might need to disconnect the internal channel cable from the SCSI RAID cable connector (J17) on the I/O board and connect it to the RAID adapter. No recabling is needed for a ServeRAID 6i adapter. See the information that comes with your RAID adapter.
- If you install a RAID adapter to control external hard disk drives, connect one end of the RAID external channel cable (separately orderable) to an external channel connector on the edge of the RAID adapter that is accessible from the rear of the server; then, route the cable to the external SCSI device and connect it to the applicable connector.

  Note: See the documentation that comes with the RAID adapter for any additional cabling instructions. That documentation also provides information about installing the RAID software and configuring the RAID adapter. For a list of supported RAID adapters, go to http://www.ibm.com/pc/us/compat/.
- Before attempting to install a new adapter, make sure that there is an available slot at the correct bus speed for it. If you need additional PCI-X slots, you can purchase a remote I/O expansion enclosure through your IBM marketing representative or authorized reseller.

Notes:
1. Before hot-swapping any PCI-X adapters, read the information in "Working inside a server with power on" on page 30.
2. For hot-pluggable adapters, make sure that the PCI hot-plug device driver is installed. For details, see the documentation that comes with the adapter.
3. For information on cabling the Remote Supervisor Adapter II and on updating its software and firmware, see the *User's Guide* on the IBM *xSeries Documentation* CD.

Installing a PCI or PCI-X adapter

Complete the following steps to install a PCI/PCI-X adapter.

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.

2. If the adapter is not hot-pluggable, turn off the server and peripheral devices, and disconnect the power cords and all external cables.

3. Remove the server cover (see "Removing the cover and bezel" on page 32) and determine which PCI-X expansion slot you will use for the adapter.
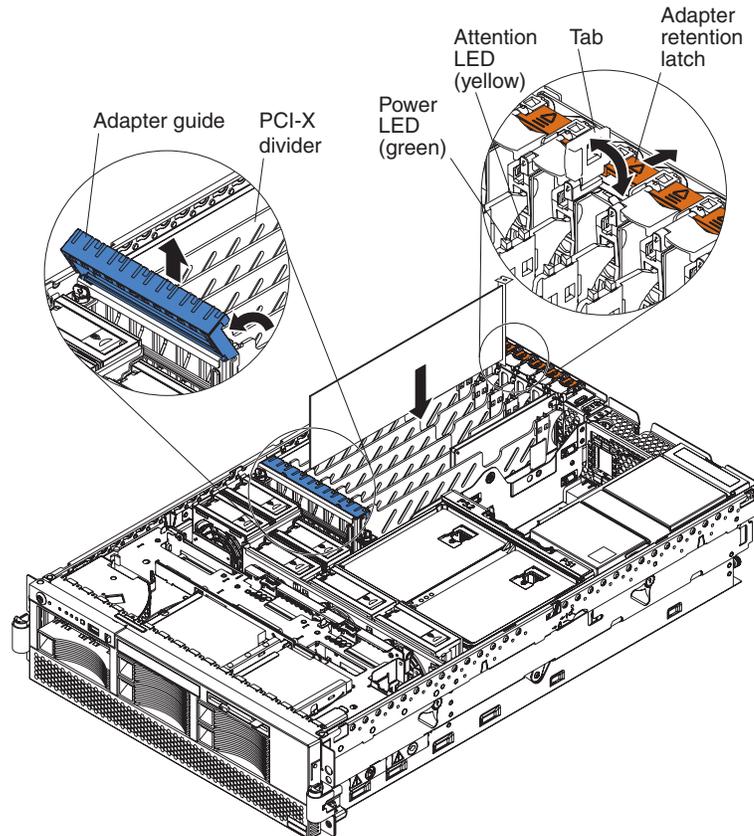
4. See the documentation that comes with your adapter for instructions for setting jumpers or switches and for any cabling instructions.

   Note: Route adapter cables before you install the adapter.

5. Set any jumpers or switches as described by the adapter manufacturer.

6. Install the adapter:

   a. Open the blue adapter guide by lifting the front edge, as shown in the illustration.

   b. Push the orange adapter retention latch toward the rear of the server and open the tab. The power LED turns off for the slot.

   c. Remove the expansion-slot cover.

   d. Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI-X board.

   e. If necessary remove the extension handles or bracket before installing a long adapter.

Attention: When you install an adapter, avoid touching the components and gold-edge connectors on the adapter. Be sure the adapter is correctly seated in the connector. Incorrectly seated adapters might cause damage to the I/O board or to the adapter.

    f. Press the adapter *firmly* into the adapter connector.

    g. Push down on the blue adapter guide to stabilize the adapter.

    h. Close the tab; then, push down on the blue adapter retention latch until it clicks into place, securing the adapter.

7. Connect any required cables to the adapter.

8. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Removing a PCI or PCI-X adapter

To remove an adapter, complete the following steps:

1. Complete steps 1 on page 35 through 3 on page 35.

2. Open the blue adapter guide (see step 6a on page 35) and the orange adapter retention latch (see step 6b on page 35).

3. If the adapter has any internal cables, disconnect them.

4. Carefully grasp the adapter by its top edge or upper corners and pull the adapter up and out of the server.

5. If the adapter slot will remain empty, close the blue adapter guide and the orange adapter retention latch, and replace the expansion slot cover.

6. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Installing a hot-swap hard disk drive

The following notes describe the types of hard disk drives that your server supports and other information that you must consider when installing a hard disk drive:

- The server supports up to six 26 mm (1-inch), 3.5-inch, hot-swap hard disk drives in the hot-swap bays.

- Each hot-swap drive is in a tray, which has a green activity LED and an amber status LED in the upper-right corner. The activity LED flashes when the drive is active; the status LED is lit if the drive has an error. Each hot-swap drive has a single-connector-attached (SCA) connector, which connects directly into the hot-swap SCSI hard disk drive backplane. The backplane controls the SCSI IDs for the hot-swap drives.

- Before you install a hot-swap hard disk drive, take the following actions:

  - Inspect the drive tray for any signs of damage.

  - Make sure that the drive is installed in the tray correctly.

  - If your server has an optional RAID adapter installed, see the documentation that comes with the adapter for information about installing a hard disk drive.

Complete the following steps to install a hard disk drive:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.

2. Remove the filler panel and air baffle from one of the empty hot-swap bays, if present.

   Attention: To maintain proper system cooling, do not operate the server for more than 10 minutes without either a drive or filler panel installed in each bay.

Drive-tray assembly

Drive handle
(in open position)

Air baffle

Filler panel
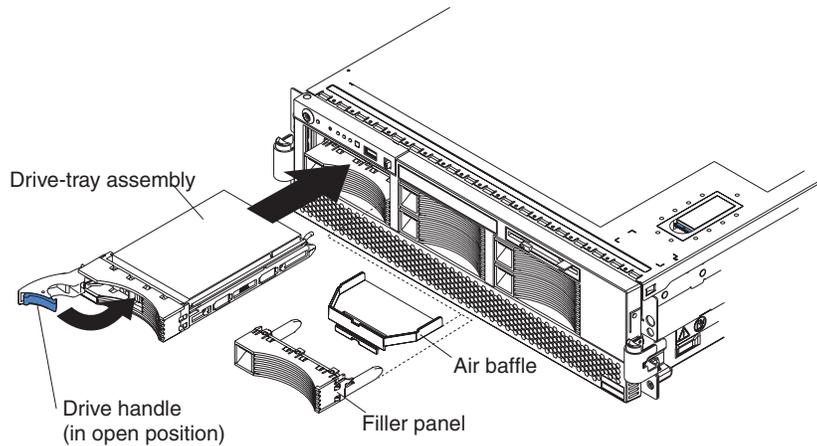
3. Install the hard disk drive in the hot-swap bay:

   a. Make sure that the tray handle is open (that is, perpendicular to the front of the drive).

   b. Align the drive assembly with the guide rails in the bay.

   c. Gently push the drive assembly into the bay until the drive stops.

   d. Push the tray handle to the closed (locked) position.

   e. Check the hard disk drive status LED to make sure that the hard disk drive is operating correctly. If the amber hard disk drive status LED for a drive is lit continuously, that individual drive is faulty and needs to be replaced. If the green hard disk drive activity LED is flashing, the drive is being accessed.

4. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

   Note: If the server has a RAID controller or adapter installed, you might need to reconfigure the disk arrays after installing hard disk drives. See the documentation that comes with the adapter for more information.

Replacing the CD-ROM drive

Complete the following steps to replace the CD-ROM drive:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.

2. Turn off the server, disconnect all power cords and external cables, and remove the top cover (see "Removing the cover and bezel" on page 32).
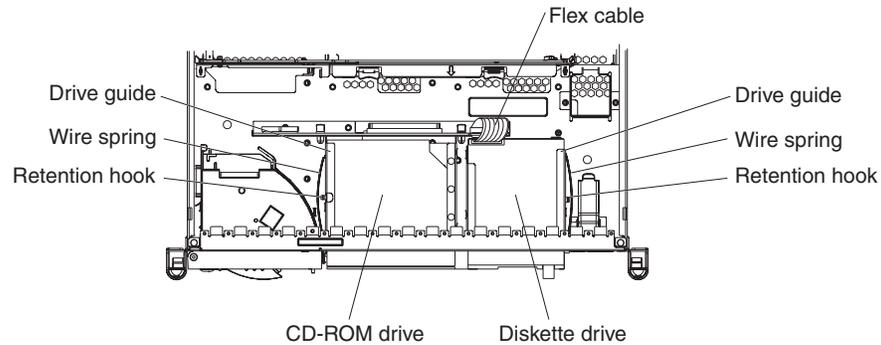
3. Slip the wire spring from under the retention hook and pull it away from the drive. Set the wire spring aside.

4. Slide the drive out of the front of the server.

5. Slide the replacement drive into the bay.

6. Align the holes in the side of the drive with the hole in each drive guide.

7. Push each end of the wire spring through the hole in the drive guide (beginning with the front hole) and into the hole in the drive; then, push the middle of the wire spring under the retention hook.

8. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58

Memory modules

The following notes describe the types of dual inline memory modules (DIMMs) that your server supports and other information that you must consider when installing DIMMs:

- Your server supports 2.5 V, 184-pin, error correcting code (ECC), double-data rate (DDR) SDRAM, PC2100 registered DIMMs with Chipkill memory protection.
- DIMMs can be removed and replaced through the of the memory cassette.
- You can increase the amount of memory in the server by replacing the DIMMs with higher-capacity DIMMs or installing additional pairs of DIMMs in open sockets. The server supports 512 MB, 1 GB, and 2 GB DIMMs. See the ServerProven® list at http://www.ibm.com/pc/compat/ for an updated list of memory modules supported by the server.
- For a server with an *8-DIMM-connector memory cassette,* you can increase the memory capabilities of your server by upgrading to the *16-connector memory cassette.* The *16-connector memory cassette* supports memory mirroring and Memory ProteXion. See the ServerProven list at http://www.ibm.com/pc/compat/ for a list of memory cassettes supported by the server. More information on Memory ProteXion and memory mirroring is available in the *User's Guide* on the *xSeries Documentation* CD.
- The server uses interleaved DIMMs, which requires that you install DIMMs in specific configurations:
  - In the *8-DIMM-connector memory cassette,* install DIMMs in pairs. Each pair must be of the same type, capacity, and speed. The DIMM connectors are arranged in two groups of four rows each; the server comes with one pair of DIMMs installed in DIMM connectors 1 and 5 in the memory cassette.
  - In the *16-DIMM memory cassette,* the DIMM connectors are arranged in two groups of eight rows each. In non-mirrored mode, install DIMMs in pairs; in mirrored mode, install DIMMs in quads, or groups of 4. Each pair or quad must be of the same type, capacity, and speed.
- You must populate the DIMM connectors in the following order with the largest size first:

8-DIMM memory board

First pair	DIMMs 1 and 5
Second pair	DIMMs 2 and 6
Third pair	DIMMs 3 and 7
Fourth pair	DIMMs 4 and 8

16-DIMM memory board in non-mirrored mode

First pair	DIMMs 1 and 3
Second pair	DIMMs 14 and 16
Third pair	DIMMs 2 and 4
Fourth pair	DIMMs 13 and 15
Fifth pair	DIMMs 5 and 7
Sixth pair	DIMMs 10 and 12
Seventh pair	DIMMs 6 and 8
Eighth pair	DIMMs 9 and 11

16-DIMM memory board in mirrored mode

First quad	DIMMs 1, 3, 14, and 16
Second quad	DIMMs 2, 4, 13, and 15
Third quad	DIMMs 5, 7, 10 and 12
Fourth quad	DIMMs 6, 8, 9 and 11

Note: When memory mirroring is enabled, reported memory is reduced to half of installed memory.

Use the Configuration/Setup Utility program to enable or disable mirrored mode. More information about memory mirroring is available in the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

DIMM banks and ports

The DIMMs constitute the following memory banks and use the following memory ports:

8-DIMM memory board
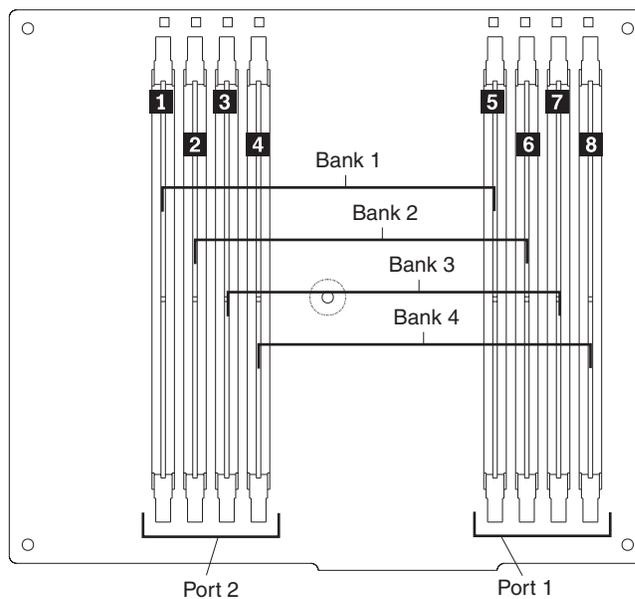
16-DIMM memory board
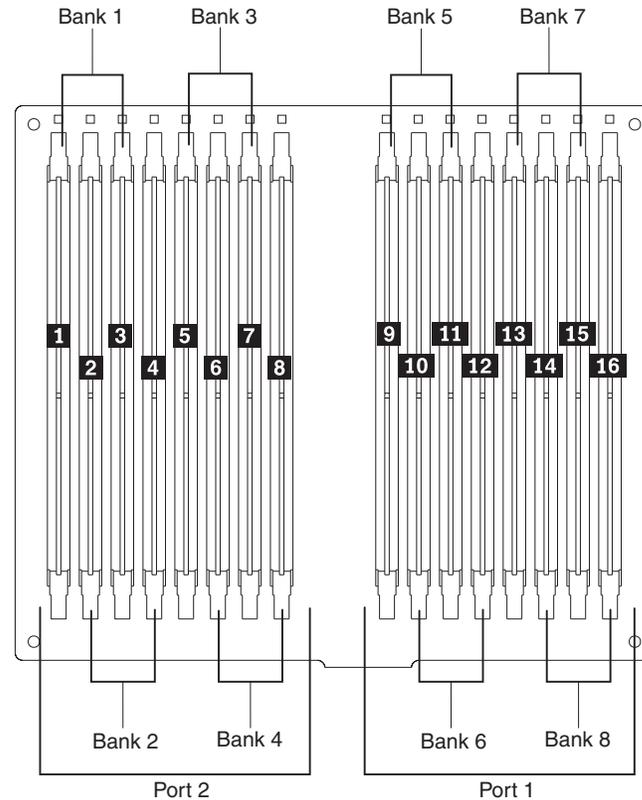
When you restart the server after adding or removing a pair or quad of DIMMs, the server displays a message that the memory configuration has changed.

DIMM installation

Complete the following steps to install DIMMs:

Note: Depending on the model, the memory cassette in your server might not have doors; this is normal. If the memory cassette has no doors, disregard any instructions to open or close the doors.

1. Read "Safety information" on page 147, "Installation guidelines" on page 29, and the documentation that comes with the DIMMs.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the top cover (see "Removing the cover and bezel" on page 32).
3. Open the two DIMM access doors on the top of the memory cassette.
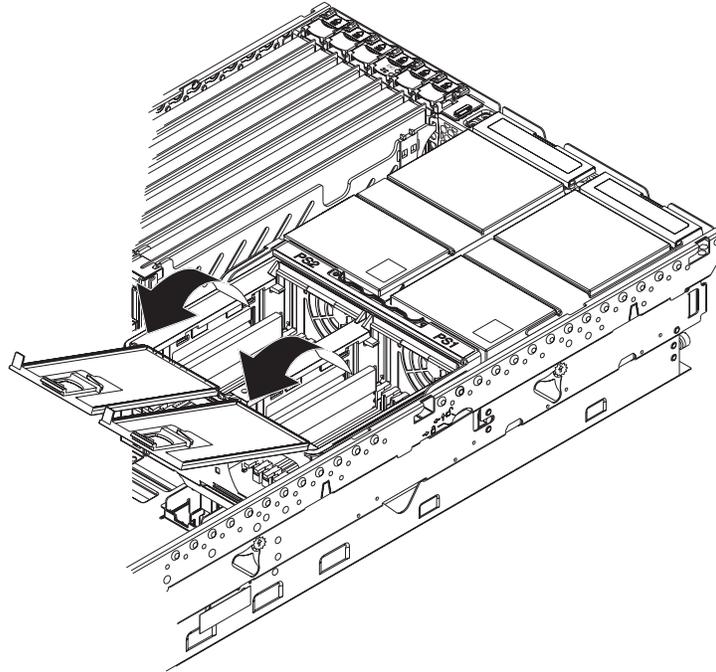
4. Open the retaining clip on each end of the DIMM connector.

   Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.

5. Touch the static-protective package that contains the DIMM option to any unpainted metal surface on the server. Then, remove the DIMM from the package.

6. Turn the DIMM so that the DIMM keys align correctly with the slot.

   Note: The following illustration shows installing DIMMs in an 8-DIMM-connector memory board.

DIMM 2

DIMM 6

DIMM 1

DIMM connector 2

DIMM connector 6

DIMM 5

Retaining clips
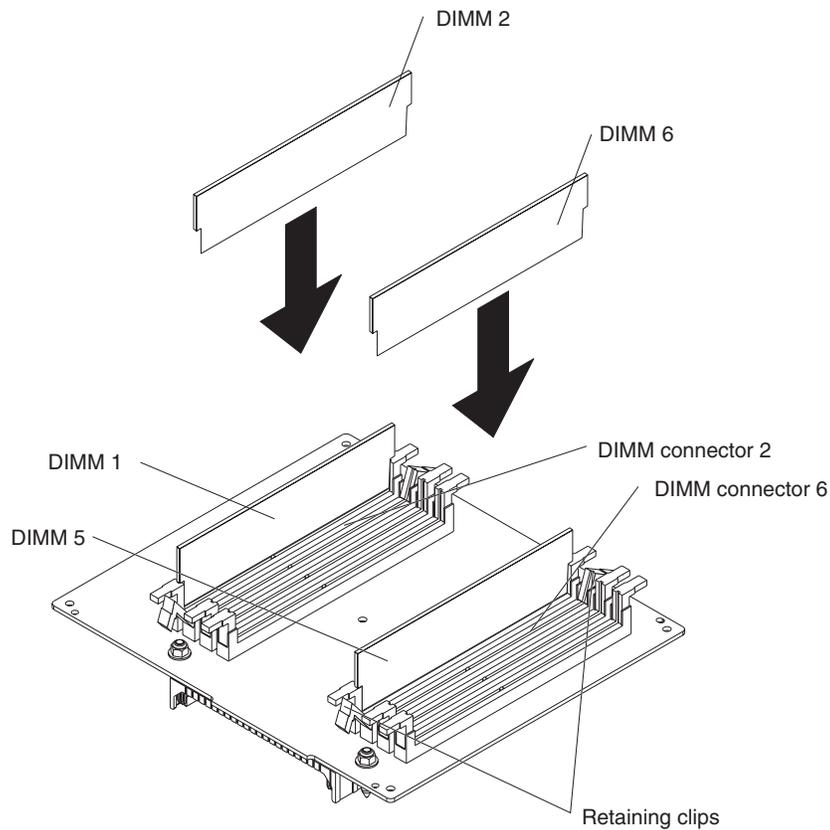
7. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.

8. Repeat steps 4 on page 42 through 7 for each additional DIMM that you install. Close the DIMM access doors when you have finished.

9. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Installing a microprocessor

The following notes describe information that you must consider when installing a microprocessor in the server:

- The server comes with a minimum of one microprocessor installed on the microprocessor board in the microprocessor tray and supports up to four microprocessors. With more than one microprocessor, the server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load among the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications. The following illustration shows the microprocessor connectors and the microprocessor voltage regulator module (VRM) connectors on the microprocessor tray assembly.

  Note: The voltage regulators for microprocessors 1 and 2 are integrated on the microprocessor tray assembly; the VRMs for microprocessors 3 and 4 come with the microprocessor options and must be installed on the microprocessor tray assembly.
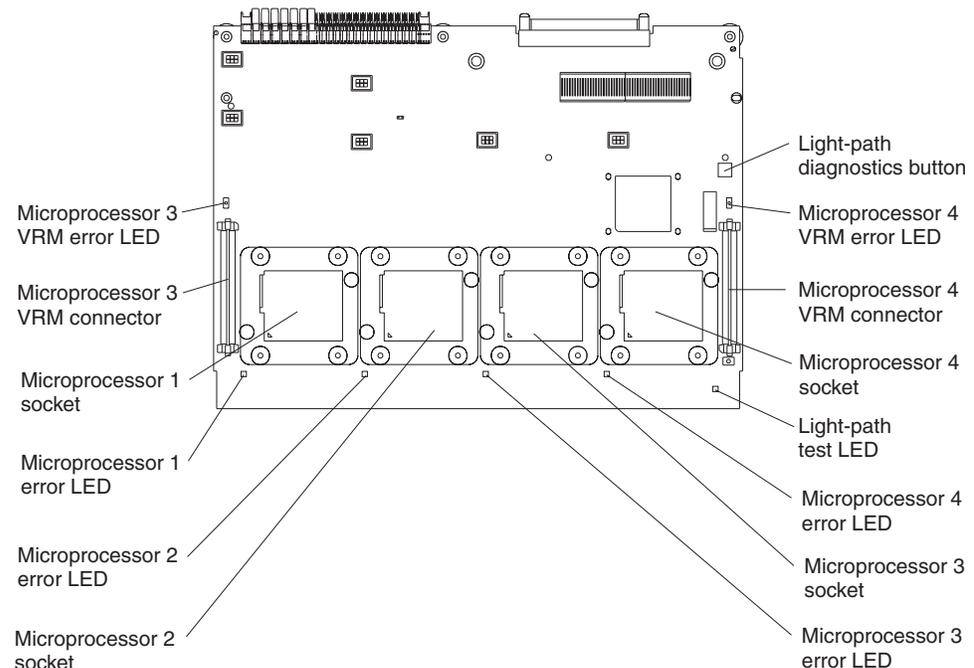
- If one microprocessor is installed:
  - The microprocessor is installed in microprocessor connector 1 (U22).
  - The microprocessor supports both the startup and application processes.
- If you install additional microprocessors in the server, microprocessor 2 is installed in microprocessor connector 2 (U23); microprocessor 3 is installed in connector 3 (U24); microprocessor 4 is installed in connector 4 (U25).
- A new microprocessor comes in a kit with a VRM and a heat sink. The VRM is used only with microprocessor 3 or 4.
- Read the documentation that comes with the microprocessor to determine whether you need to update the server basic input/output system (BIOS) code. The most current level of BIOS code for the server is available from http://www.ibm.com/pc/support.

- To use SMP, obtain an SMP-capable operating system. For a list of supported operating systems, go to http://www.ibm.com/pc/compat/.

Attention: To avoid damage and to ensure proper server operation, review the following information before you install a microprocessor:

- Make sure that the microprocessors are the same type, have the same cache size, and have the same clock speed.
- Make sure that the microprocessor internal and external clock frequencies are identical.
- See the ServerProven list at http://www.ibm.com/pc/compat/ for a list of microprocessors that are supported by the server.
- When installing additional microprocessors, populate the microprocessor connectors in numeric order, starting with connector 2. If you install the microprocessors in the wrong order, the server will not turn on.
- Avoid touching the components and pins on the microprocessor. Ensure that the microprocessor is completely and correctly seated in the socket. Incomplete insertion might cause damage to the microprocessor board or to the microprocessor.

Complete the following steps to install a microprocessor:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover and bezel (see "Removing the cover and bezel" on page 32).
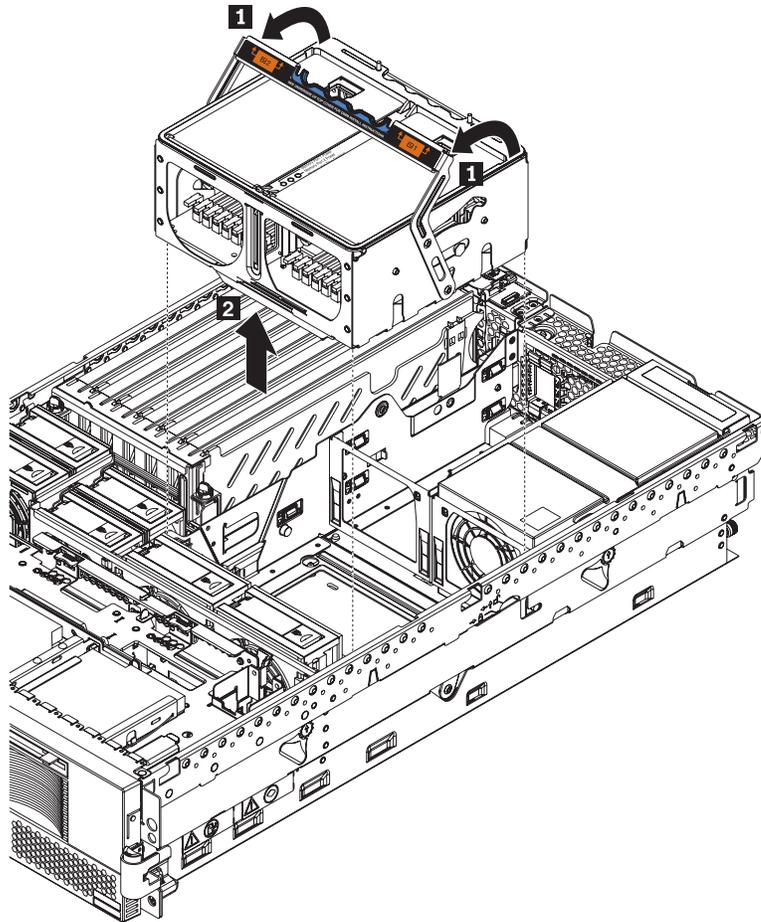
4. Remove the memory cassette (see "Replacing the memory cassette" on page 56).

Hot-swap fan 5
Hot-swap fan 6
Fan Error LED
Hot-swap fan 3
Hot-swap fan 4
Hot-swap fan 1
Hot-swap fan 2
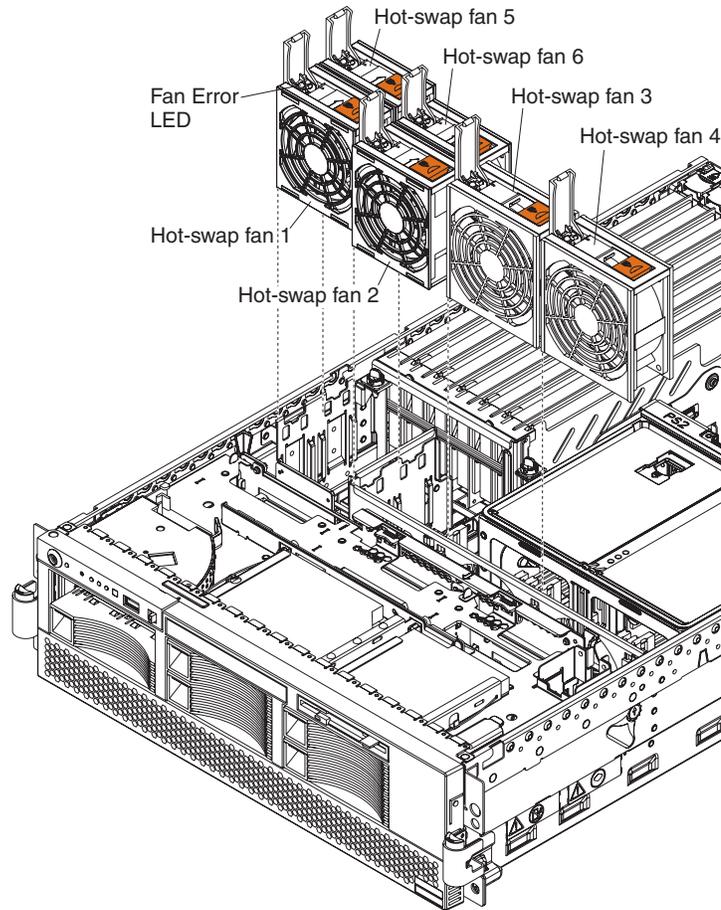
5. Remove all fans (see "Replacing a hot-swap fan" on page 55).

Microprocessor-tray release latch

Microprocessor-tray levers
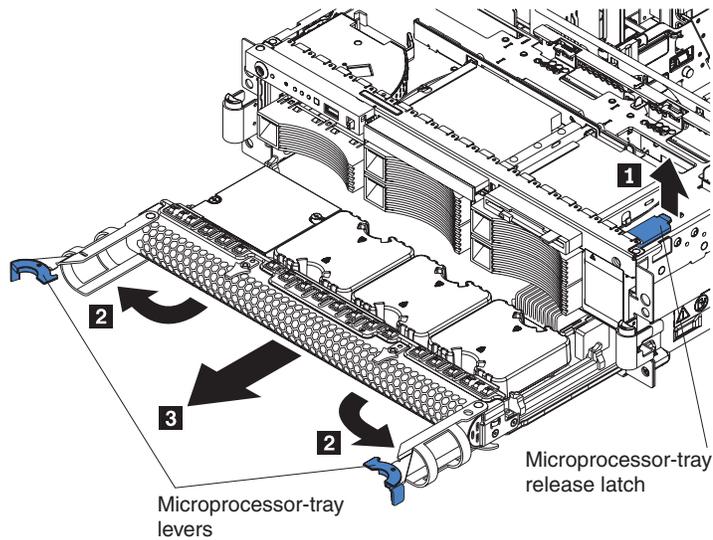
6. Remove the microprocessor tray:

   a. Lift the microprocessor-tray release latch (**1**).

   b. Open the microprocessor-tray levers (**2**).

   Attention: The microprocessor tray is heavy. Pull the tray part-way out of the server, reposition your hands to grasp the body of the tray, and then pull the tray out the rest of the way.

c. Pull out the microprocessor tray (**3)**).

> **Note:** The new microprocessor comes in a kit with a VRM and a heat sink. The VRM is used only with microprocessors 3 and 4.

Captive screws

Heat sink 3

Microprocessor 3

Microprocessor 3 VRM

Microprocessor baffle

Microprocessor-tray levers
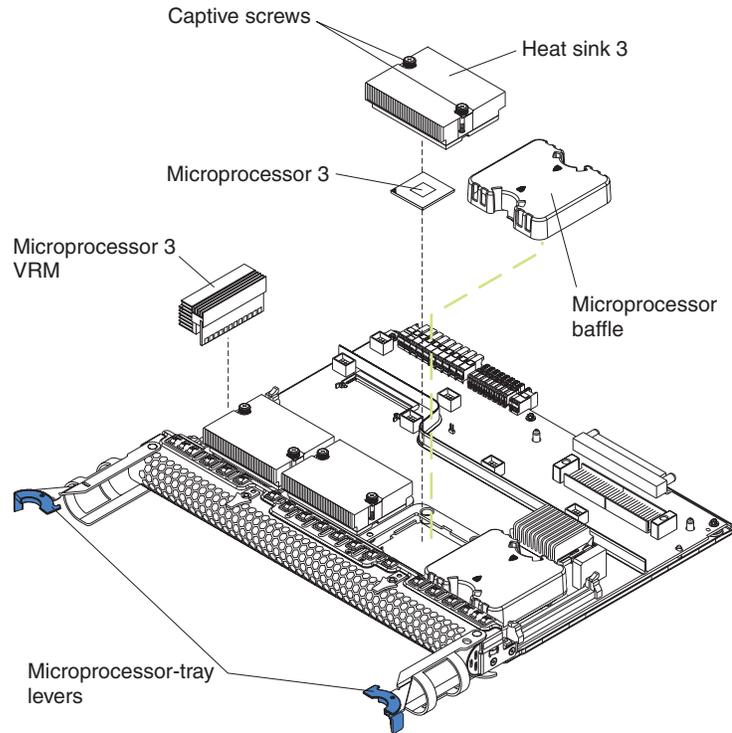
7. Remove the microprocessor baffle from the empty microprocessor socket and store the microprocessor baffle for future use.
8. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if any is present.
9. Lift the microprocessor-release lever to the open position (135°).
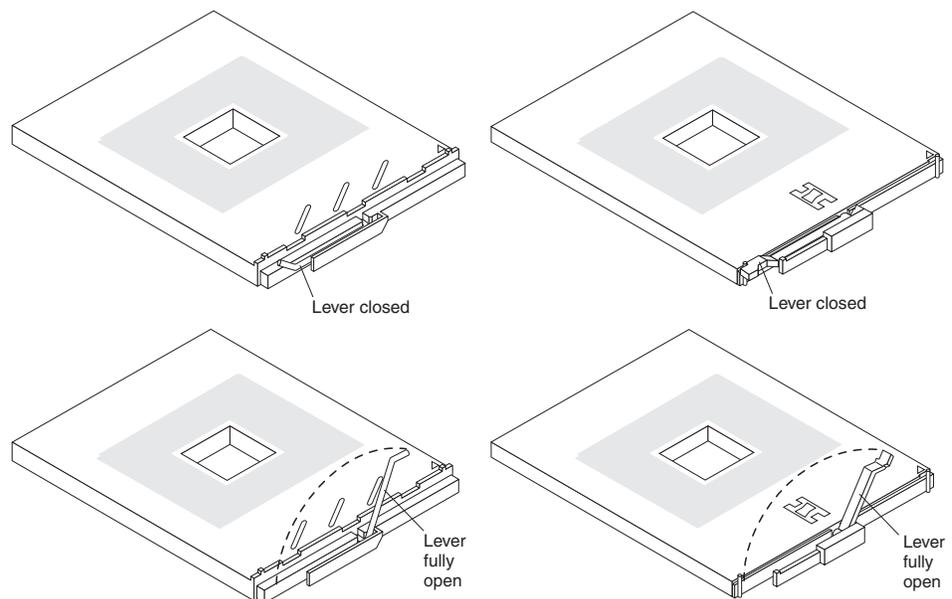
Lever closed

Lever closed

Lever fully open

Lever fully open

Attention: You must ensure that the locking lever on the microprocessor socket is in the fully-open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and microprocessor-tray assembly.

10. Install the microprocessor:

    a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the server; then, remove the microprocessor from the package.

    b. Position the microprocessor over the microprocessor connector as shown in the following illustration. Carefully press the microprocessor into the socket.

       Attention: To avoid bending the pins on the microprocessor, do not use excessive force when pressing it into the socket.
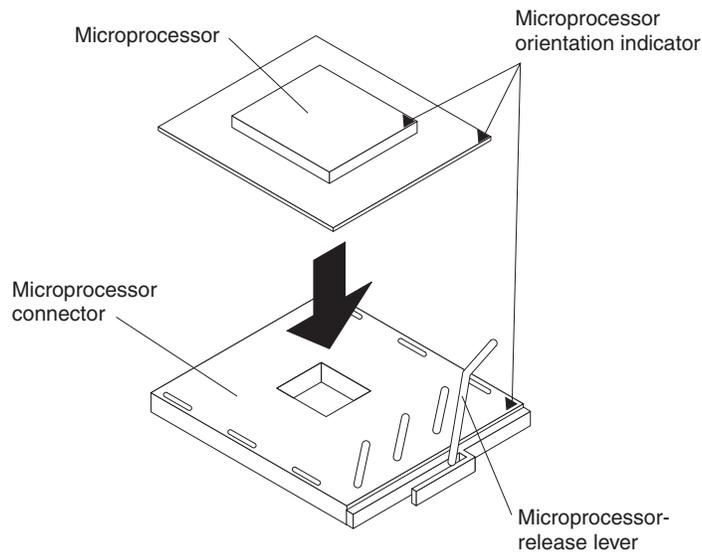
11. Close the microprocessor-release lever to secure the microprocessor.

    Attention:

    • Do not disturb or contaminate the thermal material on the bottom of the new heat sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.

    • If you need to remove the heat sink after installing it, note that the thermal material might have formed a strong bond between the heat sink and the microprocessor. Do not force the heat sink and microprocessor apart; doing so can damage the microprocessor pins. Loosening one captive screw fully before loosening the other captive screw helps break the bond between the components without damaging them.

12. Remove the heat sink from its package and remove the cover from the bottom of the heat sink. Make sure that the thermal material is still on the bottom of the heat sink. Remove the release liner and orient the heat sink above the microprocessor; then, press the heat sink into place. Press firmly on the captive screws and tighten them, alternating between screws until they are tight. Do not overtighten the screws.

13. If you installed microprocessor 3 or 4, install the VRM in the associated VRM socket.

    a. Open the retaining clips at either end of the VRM connector.

       Attention: To avoid breaking the VRM retaining clips or damaging the VRM connectors, open and close the clips gently.

b. Turn the VRM so that the VRM keys align correctly with the connector.

c. Insert the VRM into the connector. Firmly press the VRM straight down into the connector by applying pressure on both ends of the VRM simultaneously. The retaining clips snap into the locked position when the VRM is firmly seated in the connector. If there is a gap between the VRM and the retaining clips, the VRM has not been correctly inserted; open the retaining clips, remove the VRM, and then reinsert it.

14. Reinstall the microprocessor tray in the server.

a. Make sure the microprocessor-tray release latch is open; then, push the microprocessor tray into the server.

Attention: Before installing the microprocessor tray, fans must be removed from the server and the microprocessor-tray release latch must be open. Attempting to insert the microprocessor tray if any fans are installed or if the latch not fully open will result in damage to the microprocessor tray.

b. Close the tray levers and make sure they are securely latched.

c. Press the microprocessor tray release latch down.

d. Reinstall the fans and memory cassette in the server.

15. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Installing a hot-swap power supply

Note: Under some conditions, the two rear fans in front of the power supplies will be operating when the server is turned off and connected to ac power. This enables the power supplies to be cooled when they are generating power for standby functions.

The following notes describe information that you must consider when installing a hot-swap power supply in the server:

- The server comes with a minimum of one power supply and supports up to two power supplies.
- The power supplies are numbered from left to right (1 to 2) as viewed from the rear of the server. Power supplies must be installed in the following sequence: power supply 1, then power supply 2.
- If you install or remove a power supply, observe the following precautions:

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.

Locking latch

Locking handle (open)

Power supply 2 (PS2)
AC power connector cover

Power supply 1 (PS1)

AC power LED (green)

AC

DC power LED (green)

DC

Fan LED (amber)
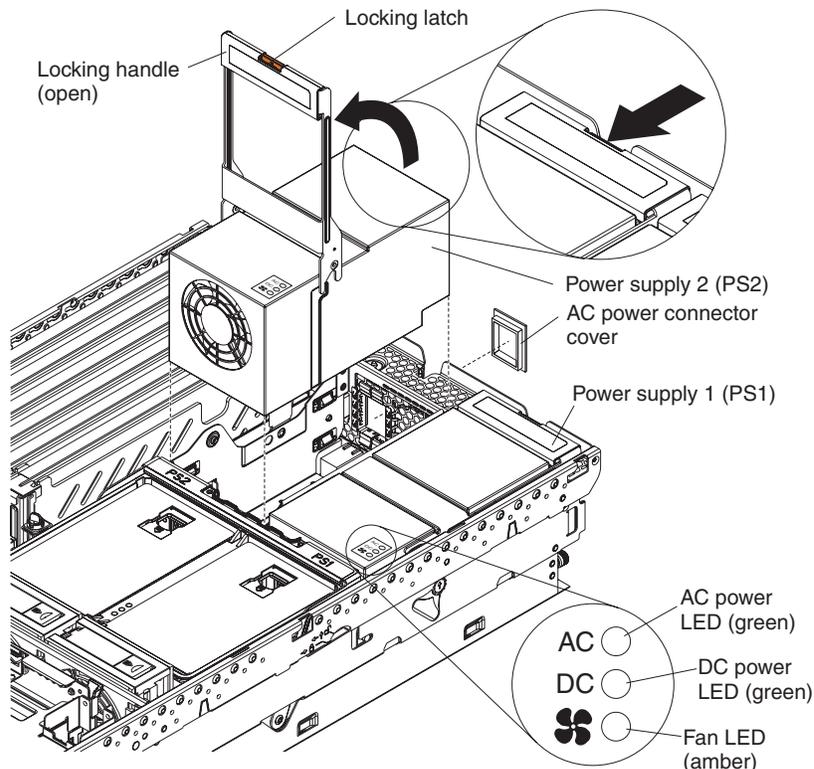
Complete the following steps to install a hot-swap power supply:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.
2. Remove the cover (see "Removing the cover and bezel" on page 32).
3. If you are adding a power supply to an empty power bay, remove the cover from the ac power connector opening on the rear of the server.
4. If you are replacing a failed power supply, remove the failed power supply from the bay.
   a. Unplug the power cord from the connector on the back of the failed power supply.
   b. Press the locking latch on the power supply handle and move the locking handle to the open position.
   c. Lift the failed power supply out of the bay.
5. Raise the power supply handle to the open position.
6. Place the new power supply into the power bay in the chassis and fully close the locking handle.
7. Connect one end of the power cord for the new power supply into the connector on the back of the power supply; route the power cord through the cable-management arm and connect the other end of the power cord into a properly grounded electrical outlet.
8. Make sure that the ac power LED on the rear of the power supply and the ac power LED on the top of the power supply are lit, indicating that the power supply is operating correctly. If the server is turned on, make sure that the dc power LED on the top of the power supply is lit also.
9. Continue with "Completing the installation" on page 58.

Replacing the battery

The following notes describe information that you must consider when replacing the battery in the server.

- When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.
- After you replace the battery, you must reconfigure the system and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

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.

Complete the following steps to replace the battery:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29, and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see "Removing the cover and bezel" on page 32
4. Using the illustrations at "Replacing the I/O board and power backplane assembly" on page 81 as a reference, locate the battery on the I/O board.
5. Remove the battery:
   a. Use one finger to press the top of the battery clip away from the battery.
   b. Lift and remove the battery from the socket.
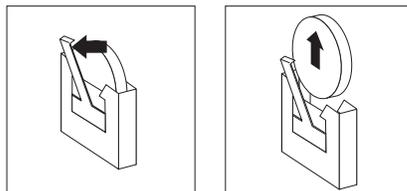
Figure 1. Removing the battery

6. Insert the new battery:
   a. Position the battery so that the positive (+) symbol is facing away from you.
   b. Use one finger to press the top of the battery clip away from the battery.
   c. Press the battery into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.
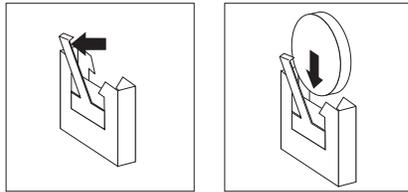
Figure 2. Installing the battery

7. Reinstall the server cover as described in "Installing the cover and bezel" on page 58.
8. Reconnect the external cables; then, reconnect the power cords and turn on the peripheral devices and the server.

   Note: You must wait approximately 20 seconds after you connect the power cord of the server to an electrical outlet before the power-control button becomes active.

9. Start the Configuration/Setup Utility program and set configuration parameters.
   - Set the system date and time.
   - Set the power-on password.
   - Reconfigure the server.

   See the section about using the Configuration/Setup Utility program in the *User's Guide* on the IBM *xSeries Documentation* CD for details.

Replacing a hot-swap fan

The following notes describe information that you must consider when replacing a hot-swap fan in the server.

- The server comes with six hot-swap fans.
- You do not need to turn off the power to the server to replace a hot-swap fan.

Attention: If a fan fails, replace it within 48 hours to help ensure proper cooling.

Complete the following steps to replace a hot-swap fan:

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.
2. Remove the top cover (see "Removing the cover and bezel" on page 32).
   Attention: To ensure proper system cooling, do not leave the top cover off the server for more than two minutes.
3. Open the fan-locking handle by sliding the orange release latch in the direction of the arrow.
4. Pull upward on the free end of the handle to lift the fan out of the server.
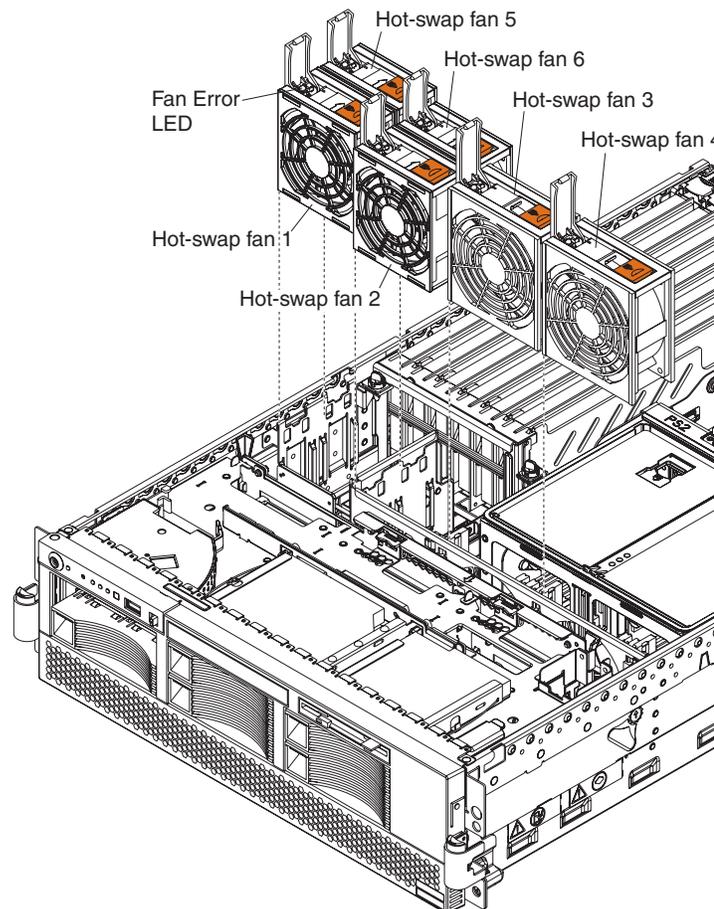
5. Open the fan-locking handle on the replacement fan, lower the fan into its socket, and rotate the handle to the locked position.
6. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Replacing the memory cassette

The following notes describe information that you must consider when replacing the 8-DIMM-connector memory cassette in the server with a 16-DIMM-connector memory cassette:

- The memory cassette is not hot-swappable; you must turn off the server before replacing the memory cassette.
- For a server with an 8-DIMM-connector memory cassette, you can increase the memory capabilities of your server by upgrading to the 16-connector memory cassette. The 16-connector memory cassette supports memory mirroring and Memory ProteXion. See the ServerProven list at http://www.ibm.com/pc/compat/ for a list of memory cassettes supported by the server.

Complete the following steps to replace the memory cassette in the server.

1. Read "Safety information" on page 147 and "Installation guidelines" on page 29.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see "Removing the cover and bezel" on page 32).
4. Remove the current memory cassette:
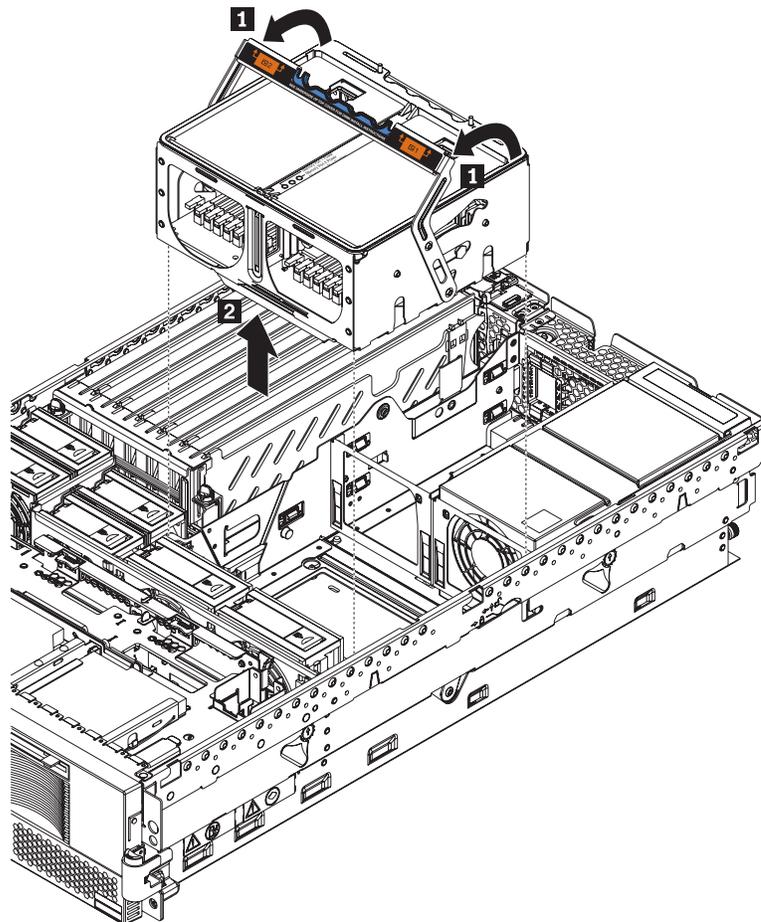
   a. Using both hands, pull the memory cassette locking handle in an arc toward the front of the server (**1**) until the memory cassette is released.
   b. Lift the memory cassette out of the server (**2**).
5. Install the new memory cassette in the server:

a. Pull the new memory cassette locking handle in an arc toward the front of the cassette.

b. Orient the cassette as shown in the illustration in step 4; then, lower the cassette into place.

c. Using both hands, rotate the locking handle toward the rear of the server, making sure when you finish that the cassette is fully seated and the locking handle is all the way down.

Note: When the cassette is fully seated and the handle is all the way down, two black pins protrude through the blue insert on the handle.
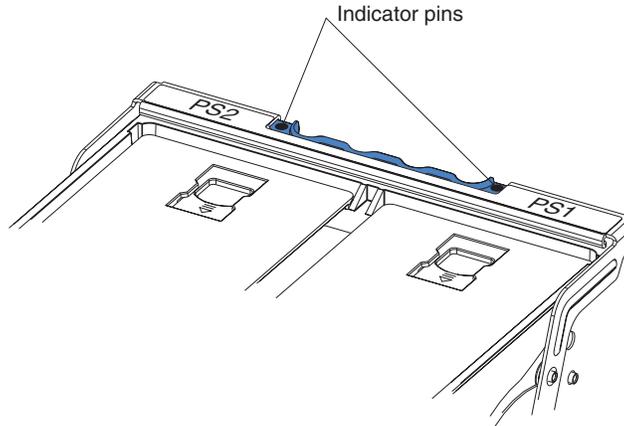
6. Install DIMMs in the memory cassette; you can use the DIMMs from the previous memory cassette. See "DIMM installation" on page 41 for the DIMM population order to use.

   Note: Use the Configuration/Setup Utility program to enable or disable mirrored memory mode.

7. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 58.

Completing the installation

This section describes how to complete the installation.

Installing the cover and bezel

Complete the following steps to install the server cover and bezel:

1. Before installing the cover, check that all internal cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
2. Move the cover-release latch to the open (up) position.
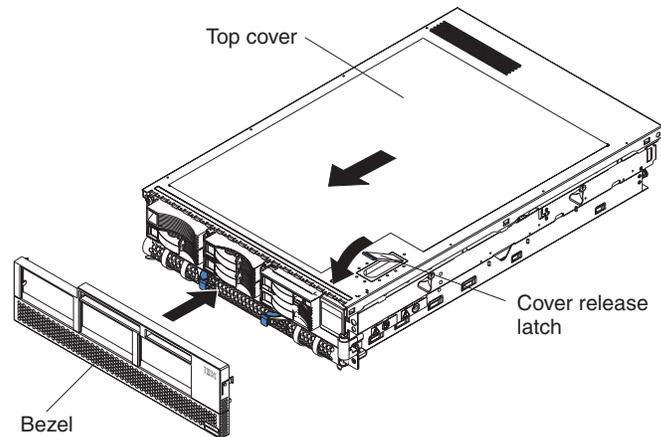
3. Position the cover on top of the server and press down on the cover-release latch. The cover slides forward into position.
4. Insert the tabs on the cover into the matching slots in the server chassis and slide the cover forward.
5. Press down on the cover-release latch. The cover-release latch slides the cover forward into position and locks the cover in place.
6. Insert the tabs on the bottom of the bezel into the matching holes on the server chassis.
7. Push the top of the bezel toward the server until the two tabs at the top of the sides of the bezel snap into place.
8. Slide the server fully into the rack cabinet.
9. If you disconnected any power cords or external cables from the server, reconnect the external cables first. If you are adding any new peripheral devices (see "Connecting the cables" on page 59 for details), you can then connect the external cables from those devices. Then, connect the power cords to properly grounded electrical outlets.

Note: Depending on the options that you installed, you might need to run the Configuration/Setup Utility program to update the server configuration. See "Updating the server configuration" on page 60, "Using the Configuration/Setup Utility program" on page 11, and the *User's Guide* for more information.

Connecting the cables

This section describes how to connect cables to the server, with particular instructions for the RXE Expansion Port, RXE Management Port, and Ethernet connectors. When instructed, see the applicable documentation for more details.

Note: The external power connection on the Remote Supervisor Adapter II is not supported on the xSeries 365 server.

For details about the locations and functions of all of the ports, indicators, and connectors see "I/O connectors" on page 61.
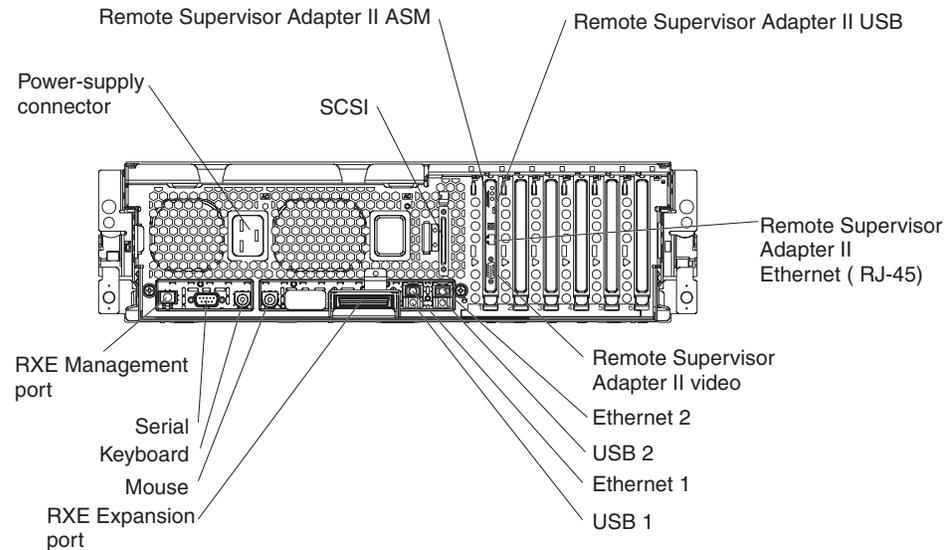
The following illustration shows the cable routing for a typical server configuration. Detailed cabling instructions, including the use of the cable management arm (shipped with the server) are in the *Rack Installation Instructions* provided with the server.

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

See the documentation that comes with any option you install for additional cabling instructions. It might be easier for you to route cables before you install certain options.

If you have just connected the power cords of the server into an electrical outlet, wait 20 seconds before pressing the power-control button.
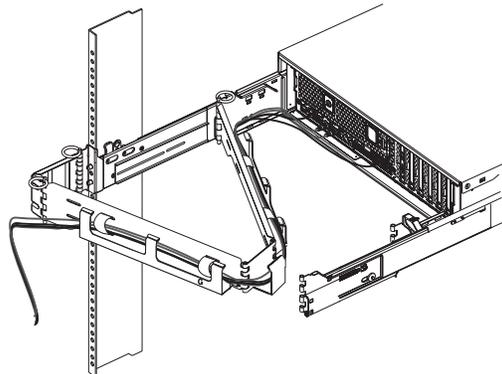
RXE connector cabling

Your server has one RXE Expansion Port and one RXE Management Port located on the rear of the server. Use these connectors to connect the server to a remote I/O enclosure and to expand the number of PCI-X slots that are available for use by the server. For detailed information about cabling the RXE ports, see the documentation that comes with the remote I/O enclosure.

Complete the following steps to cable your server to a remote I/O enclosure:

xSeries 365 Type 8861

RXE Expansion Port (A)

RXE Management Port

RXE-100

RXE Management A (in) Port
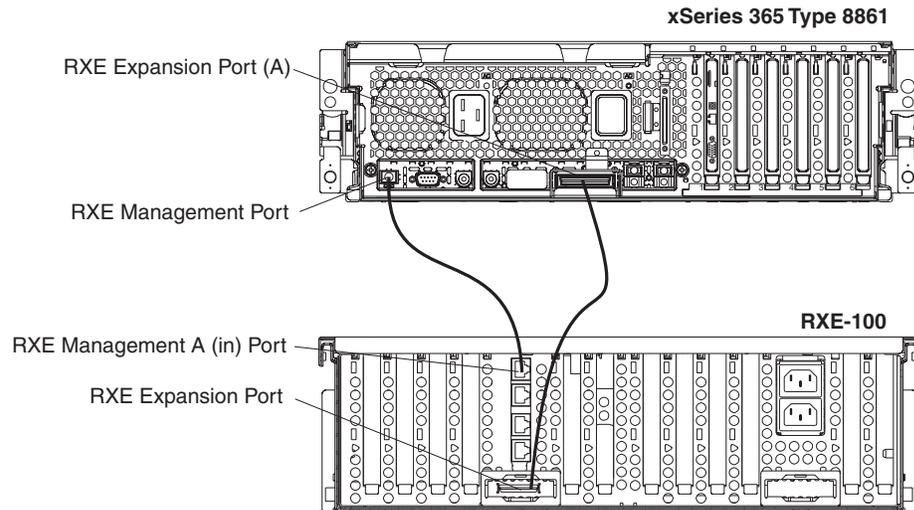
RXE Expansion Port

1. Using an RXE Expansion cable, connect one end of the cable to the RXE Expansion Port on the server.
2. Connect the opposite end of the cable to an RXE Expansion Port on the remote I/O enclosure.
3. Using an RXE Management cable, connect one end of the cable to the RXE Management Port on the server.
4. Connect the opposite end of the cable to the RXE Management A (in) Port on the remote I/O enclosure.

> **Note:** For details about cabling the server to the remote I/O enclosure and how the server and remote I/O work together, see the documentation that comes with the enclosure.

Gigabit Ethernet cabling

Your server has one dual-port Ethernet connector located on the back of the server. Use these ports to connect the server to a LAN.

Note: Another Ethernet connector is located on the Remote Supervisor Adapter II. This port is used for specific supervisory functions and should not be confused with the Gigabit Ethernet connectors above the USB ports.

Updating the server configuration

When you start the server for the first time after you add or remove an internal option or external SCSI device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see "Using the Configuration/Setup Utility program" on page 11 and the section on configuring the server in the *User's Guide* on the IBM *xSeries Documentation* CD.

Some options have device drivers that you must install. See the documentation that comes with each option for information about installing device drivers.

The server comes with at least one microprocessor on the microprocessor tray assembly. If more than one microprocessor is installed, the server can operate as a symmetric multiprocessing (SMP) server. You might have to upgrade the operating system to support SMP. For more information, see the section about using the *ServerGuide Setup and Installation* CD in the *User's Guide* and the operating-system documentation.

If the server has an optional RAID adapter and you have installed or removed a hard disk drive, see the documentation that comes with the RAID adapter for information about reconfiguring the disk arrays.

If you have installed a Remote Supervisor Adapter to manage the server remotely, see the *Remote Supervisor Adapter User's Guide*, which comes with the adapter, for information about setting up, configuring, and using the adapter.

For information about configuring the integrated Gigabit Ethernet controller, see the *User's Guide*.

I/O connectors

Your server has the following input/output (I/O) connectors:
- Serial (1, rear)
- Gigabit Ethernet (2, rear)
- Keyboard (1, rear)
- Mouse (1, rear)
- USB (2, rear; 1, front - on operator information panel)
- RXE expansion (1, rear)
- RXE management (1, rear)
- SCSI (1, rear)

The Remote Supervisor Adapter II has the following connectors:
- Remote Supervisor Adapter II Ethernet (1, rear)
- Remote Supervisor Adapter II video (1, rear)
- Remote Supervisor Adapter II ASM (1, rear)
- Remote Supervisor Adapter II USB (reserved)

The following illustration shows the USB connector on the operator information panel on the front of the server.
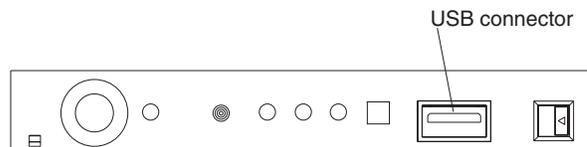
USB connector

The following illustration shows the I/O connectors on the rear of the server.
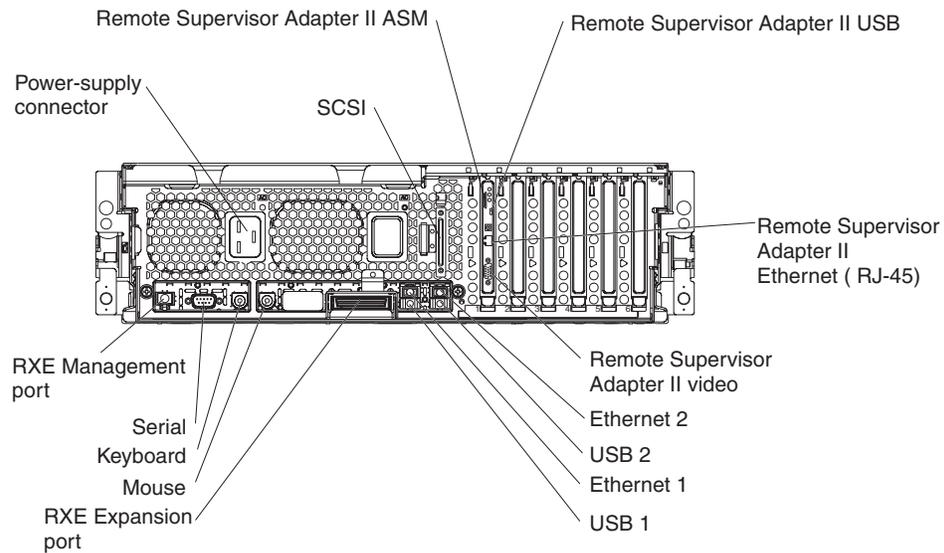
The following sections describe these connectors.

Server connectors

The following connectors are on the server.

Remote Supervisor Adapter II connectors

The following connectors are on the rear of the Remote Supervisor Adapter II:

Note: The external power connection on the Remote Supervisor Adapter II is not supported on the xSeries 365 server.

Advanced System Management (ASM) interconnect connector
Connect the ASM breakout cable to this connector to enable system management through the serial connectors and through the ASM RS-485 connectors. See the *Remote Supervisor Adapter User's Guide* for more information about the breakout cable.

USB This connector is not available for use.

Ethernet (RJ-45) connector
Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector to enable a LAN connection or Telnet session. The Ethernet connector LEDs on the Remote Supervisor Adapter II indicate whether the link is good and whether activity is taking place on the network.

Video connector
Connect the cable from the server monitor to this connector.

Attention: Do *not* connect the ASM connector to the RXE Management Port on the server.

If you want to use the Remote Supervisor Adapter II to manage the server remotely or to connect the server to another server, connect the applicable cables to the Remote Supervisor Adapter II connectors.

• To enable remote server management through a network, use the Remote Supervisor Adapter II Ethernet connector.

- To enable remote server management using a modem, use a Remote Supervisor Adapter II serial connector on the breakout cable that you connect to the ASM connector.
- To enable remote server management through a serial interface from a client workstation using a terminal-emulation program or from a hardware terminal server, connect the breakout cable to the ASM connector and make the following connections:
  - Use a null modem cable to connect your server serial connector to the serial connector labeled COM1 on the breakout cable.
  - Use a null modem cable to connect the serial connector labeled COM2 on the breakout cable to a terminal server or client serial connector.
- To connect the server with another server, use the ASM interconnect connector.

See the Remote Supervisor Adapter II documentation on the IBM *xSeries Documentation* CD for more information.

Ethernet connector

The following illustration shows an Ethernet connector.
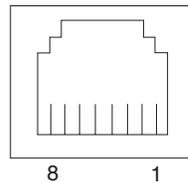
Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector. The 100BASE-TX and 1000BASE-T Fast Ethernet standards require Category 5 or higher cabling.

For more information about the Ethernet controller, see the *User's Guide*.

Universal Serial Bus connector

Use a Universal Serial Bus (USB) connector to connect a USB device. USB technology transfers data at up to 12 Mb per second (Mbps) with a maximum of 127 devices and a maximum signal distance of 5 meters (16 ft) per segment. Using Plug and Play technology, USB devices are configured automatically. The following illustration shows a USB connector.
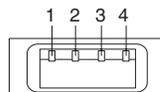
Use a 4-pin cable to connect a device to a USB connector. If you need to connect more USB devices than the server has USB connectors for, use a USB hub to connect additional devices.

If you connect a PS/2 (non-USB) keyboard to the keyboard connector, USB ports and devices are disabled during POST.

If you connect a USB keyboard that has a mouse port, the keyboard emulates a mouse, and you cannot disable the mouse settings in the Configuration/Setup Utility program.

RXE Expansion Port connector

Use this connector to connect the server to the RXE Expansion port on an optional IBM RXE-100 Remote Expansion Enclosure. The following illustration shows an RXE Expansion Port connector.
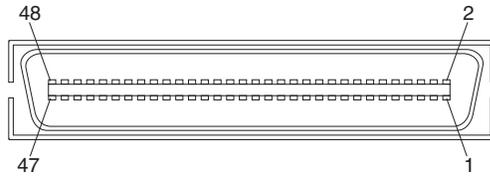
Auxiliary-device (pointing device) connector

Use this connector to connect a mouse or other pointing device. The following illustration shows an auxiliary-device connector.
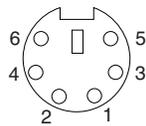
Keyboard connector

Use this connector to connect a PS/2 (non-USB) keyboard to the server. The following illustration shows a keyboard connector.
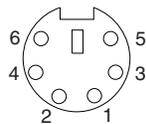
Serial connector

Use a serial connector to connect a serial device. The following illustration shows a serial connector.
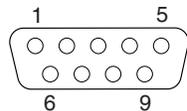
Connect a serial cable to this port to enable system management through a modem, or connect a null modem cable to enable system management through a workstation or mobile computer.

RXE Management Port connector

Use this connector to connect the server to the RXE Management A (In) Port on an optional IBM RXE-100 Remote Expansion Enclosure. The following illustration shows an RXE Management Port connector.
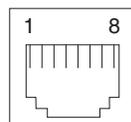
Power supply connector

Connect one end of the power-supply power cord to this connector and connect the other end to an ac power source. The server comes with one hot-swap power supply. You can add a second hot-swap power supply to obtain full power redundancy. Connect each power supply to separate ac power circuits for power redundancy.
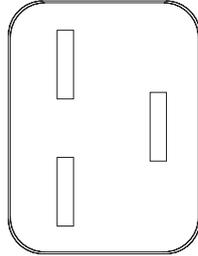
SCSI connector

Use the external small computer system interface (SCSI) connector to connect an external SCSI device to channel B of the Ultra 320 SCSI controller in the server. The following illustration shows a 68-pin external SCSI connector.

34   1

68   35
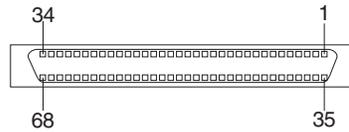
Chapter 5. FRU information (service only)

This chapter describes the removal of certain server components.

Important: The field replaceable unit (FRU) procedures are intended for trained
servicers who are familiar with IBM @server products. See the parts
listing in "System" on page 140 to determine whether the component
being replaced is a customer replaceable unit (CRU) or a FRU.

Microprocessor tray assembly

This section shows the locations of items on the microprocessor board and describes how to remove a microprocessor.

Microprocessor board connectors, jumpers and LEDs

The following illustration shows the connectors, jumpers, and LEDs on the microprocessor board.

Force power-on jumper (J10)

Microprocessor 3 VRM error LED

Microprocessor 3 VRM connector

Microprocessor 1 socket

Microprocessor 1 error LED

Microprocessor 2 error LED

Microprocessor 2 socket

Light-path diagnostics button

Microprocessor 4 VRM error LED

Microprocessor 4 VRM connector

Microprocessor 4 socket

Light-path test LED

Microprocessor 4 error LED

Microprocessor 3 socket

Microprocessor 3 error LED

The microprocessor board contains the force power-on jumper (J10), a two-pin jumper block. The default is no jumper installed over the two pins. Place a jumper over the two pins to force the server to start up when you connect the server to ac power.

Microprocessor removal

This section contains information about removing a microprocessor.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove a microprocessor:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.
2. Remove the top cover (see "Removing the cover and bezel" on page 32).
3. Remove all fans.
4. Remove the memory cassette.
5. Lift the microprocessor-tray release latch.
6. Remove the microprocessor tray assembly (see "Installing a microprocessor" on page 44).

Attention: The microprocessor tray is heavy. Pull the tray part-way out of the server, reposition your hands to grasp the body of the tray, and then pull the tray out the rest of the way.

7. Remove the heat sink by first fully loosening one screw; then, fully loosen the other screw and lift the heat sink off of the microprocessor.

Lever closed   Lever closed

Lever
fully
open

Lever
fully
open
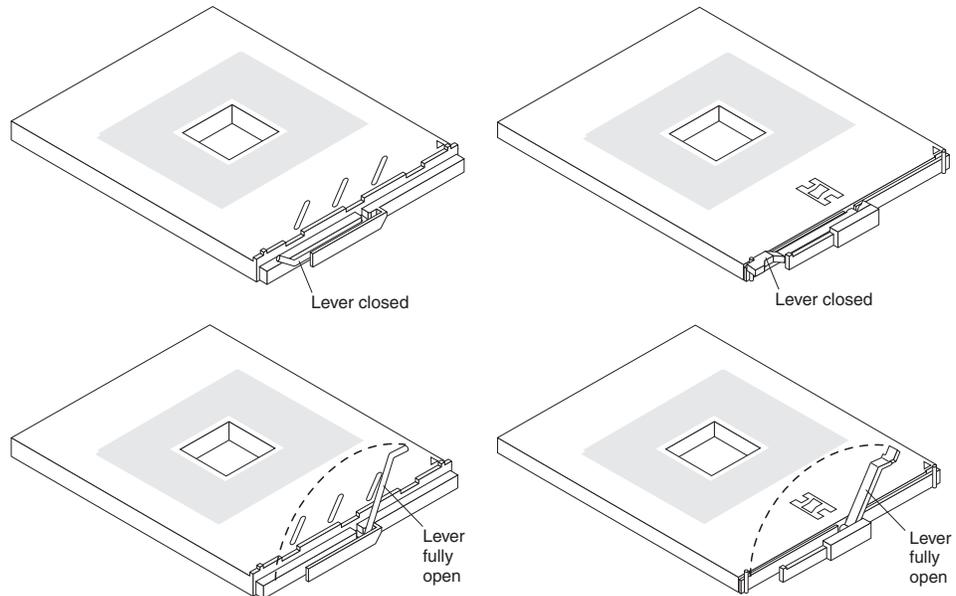
Attention: Before attempting to remove the heat sink from the microprocessor, note that the heat-conducting grease between the heat sink and the microprocessor might have formed a strong bond. Do not force the components apart; doing so can damage the microprocessor pins. Loosening one screw fully before loosening the other screw will help to break the thermal bond that adheres the heat sink to the microprocessor.

8. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown.

9. Pull the microprocessor out of the socket.

Attention: You must ensure that the locking lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and microprocessor board.

For information about installing a microprocessor, see "Installing a microprocessor" on page 44.

Thermal grease

This section contains information about removing and replacing the thermal grease between the heat sink and the microprocessor. The thermal grease must be replaced whenever the heat sink has been removed from the top of the microprocessor and is going to be reused or when debris is found in the grease.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to replace damaged or contaminated thermal grease on the microprocessor and heat sink:

1. Place the heat sink on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the heat sink.

   Note: Make sure that all of the thermal grease is removed.
4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.
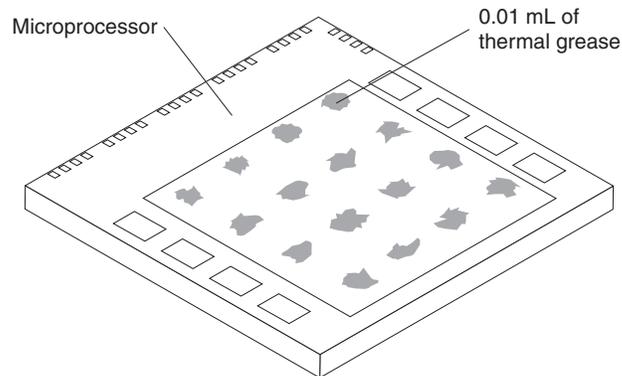
5. Use the thermal-grease syringe to place 16 uniformly spaced dots of 0.01 mL each on the top of the microprocessor.
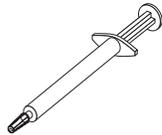
   Note: 0.01mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22 mL) of the grease will remain in the syringe.
6. Install the heat sink onto the microprocessor as described in "Installing a microprocessor" on page 44.

Diskette drive

This section contains information about removing and replacing the diskette drive.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to replace the diskette drive:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.
2. Remove the cover and bezel (see "Removing the cover and bezel" on page 32).
3. Remove the diskette drive cable from the media interposer card by completing the following steps:
   a. Push the plastic lip on the outer edge of the cable connector toward the rear of the server.
   b. Remove the cable from the connector.

Metal hook

Drive retention wire
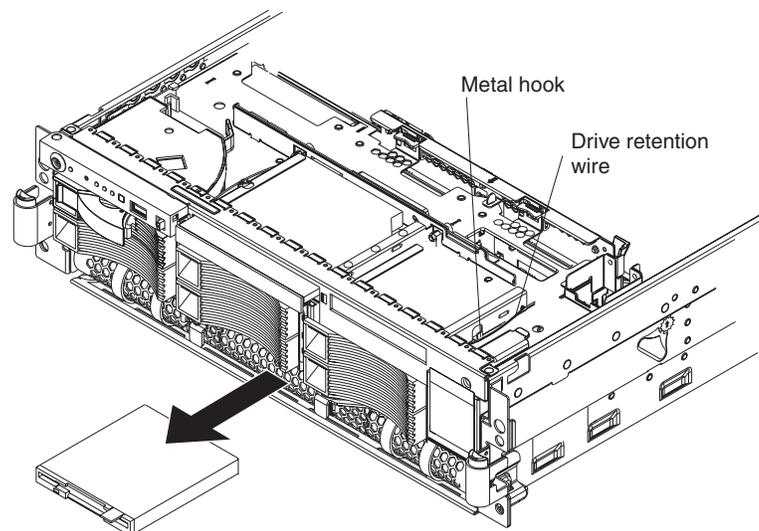
4. Remove the wire from the right side of the diskette drive.

   Note: The center of the wire fits into a metal hook. Be sure to return the wire to its position in the hook when replacing the diskette drive.

5. Slide the diskette drive out of the server by pulling it through the front bezel.
6. With the diskette drive out of the server, remove the cable from the diskette drive by pulling up on the cable retention latch. Set this cable aside carefully for reinstallation.
7. Attach the cable that was removed in step 6 to the replacement diskette drive, making sure to close the cable retention latch.
8. Slide the diskette drive into the server through the front bezel, making sure to route the cable in first.
9. When the diskette drive is in place, connect the cable to the media interposer card.
   a. Route the cable over the media interposer card.

b. Place the cable into the cable connector and pull the bottom edge of the connector toward the front of the server to secure the cable.

10. Attach the wire to the diskette drive beginning with the front hole, making sure to guide the wire into the hook.

11. Replace the bezel and top cover.

12. Reconnect external cables and power cords.

Operator information panel

This section contains information about removing and replacing the operator information panel.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to replace the operator information panel assembly:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

2. Remove the top cover and bezel (see "Removing the cover and bezel" on page 32).

3. Remove the cable from the media interposer card.

4. Remove the screw securing the corner of the pivoting panel to the chassis. When the screw is fully loosened, it might be necessary to insert the blade of the screwdriver slightly under the head of the screw and lever it up.

Curved channel
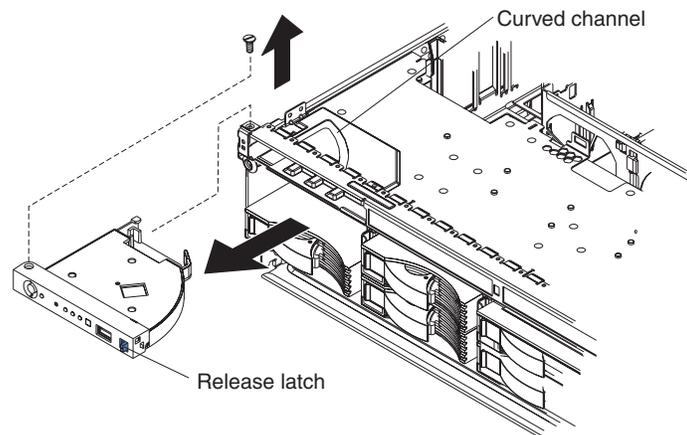
Release latch

5. Press the blue latch on the front panel to release the assembly. Do not pivot the assembly.

6. Pull the assembly slightly out of the server without pivoting the assembly.

7. Pull the assembly out of the front of the server. It might be necessary to lift the assembly up slightly while sliding it out.

8. Assemble the replacement operator information panel and cable.

9. Guiding the cable through first, insert the assembly into the server through the front. The shoulder screw on the bottom of the assembly will glide along the straight guide channel in the chassis.

10. Gently slide the assembly into the server along the straight guide channel, keeping the cable free. When the assembly is inserted all the way, the

shoulder screw on the bottom of the assembly will slide into and along the curved channel. This allows the panel to swing out.

11. Reinstall the screw that was removed in step 4 on page 72.

12. Verify that the assembly opens and closes smoothly.

13. Close and latch the operator information panel.

14. Connect the cable to the media interposer card.

15. Replace the bezel and top cover.

16. Reconnect external cables and power cords.

Media interposer card

This section contains information about removing and replacing the media interposer card.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove the media interposer card:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

2. Remove the top cover (see "Removing the cover and bezel" on page 32).

3. Pull the CD-ROM drive or DVD-ROM drive out of the server slightly to disengage it from the media interposer card.

4. Disconnect all cables from the media interposer card.
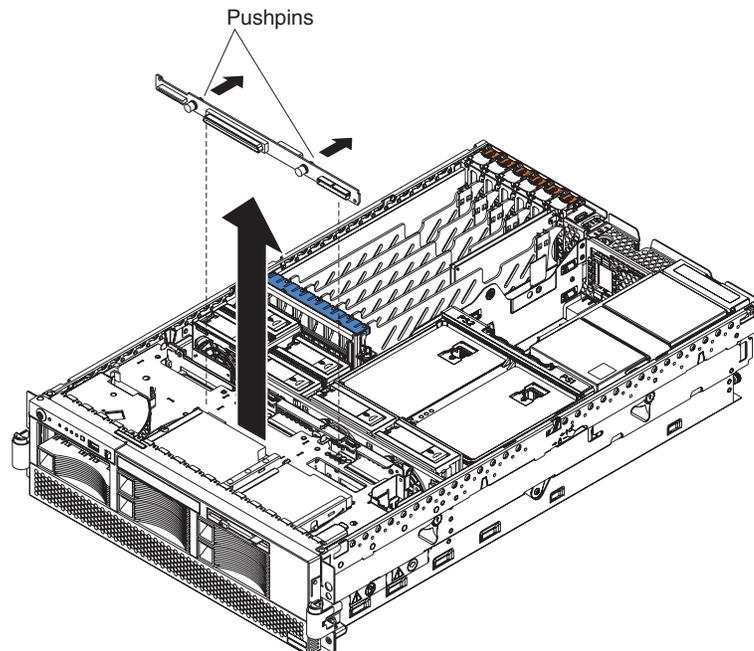
5. Pull out the two blue push pins.
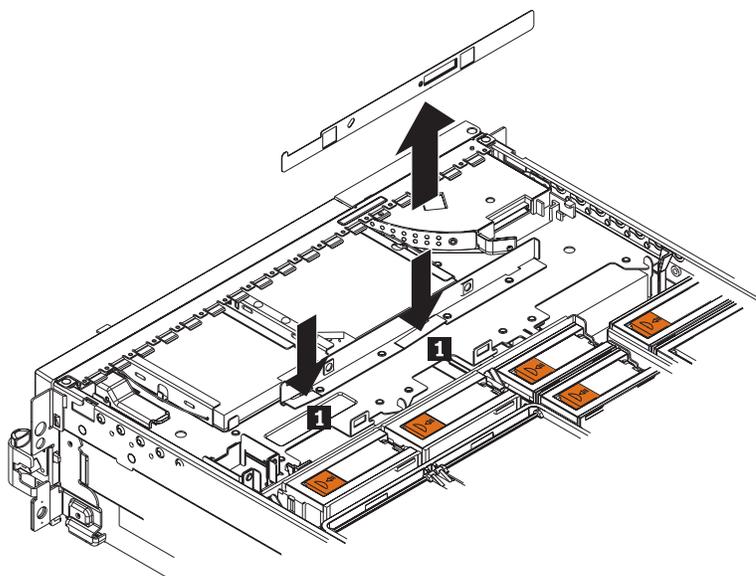
6. To release the media interposer card from the chassis, press down on the two blue touchpoints on the rectangular steel flaps (**1**) that lie flush with the chassis structure near the base of the media interposer card.
7. Pull the media interposer card out of the server.

To install the media interposer card, reverse the preceding steps.

Note: When inserting the media interposer card into the server, angle the card so that the left side of the card goes in first and fits against the metal lip on the chassis.

SCSI backplane

This section contains information about removing and replacing the SCSI backplane.

Note:
  • Read "Installation guidelines" on page 29.
  • Read "Safety information" on page 147.
  • Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove the SCSI backplane:
1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.
2. Remove the top cover (see "Removing the cover and bezel" on page 32). It is not necessary to remove the front bezel.
3. Pull the hard disk drives out of the server slightly to disengage them from the SCSI backplane.
4. Disconnect the SCSI cable from the SCSI backplane.
5. Disconnect the cable connecting the I/O board to the media interposer card.

   Note: This is the only cable that should be disconnected from the media interposer card.

Release tabs

Guide channels
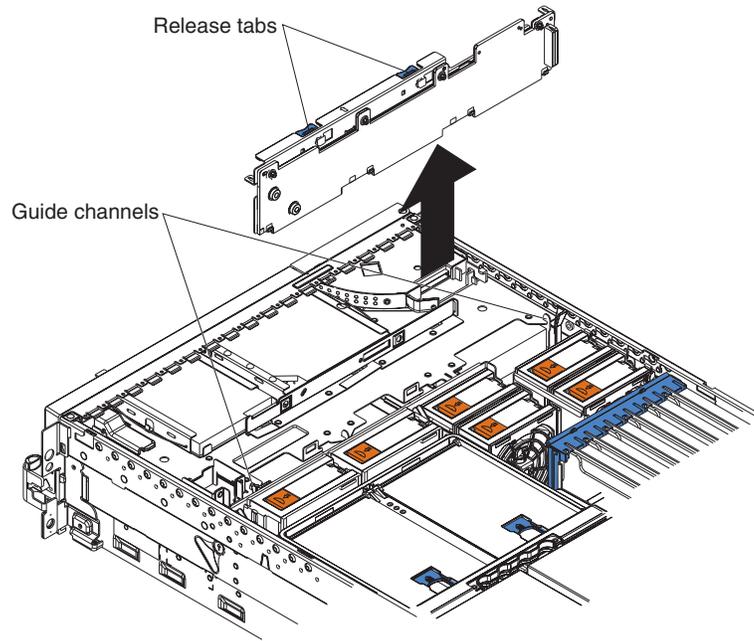
6. Pull out the two blue pushpins.

7. Squeeze the two blue release tabs.

8. Lift the SCSI backplane out of the server slightly; then, disconnect the power cable and remove the backplane.

9. Connect the power cable to the replacement backplane.

10. Slide the backplane into the two guide channels.

    Note: The cables from steps 4 on page 74 and 5 on page 74 will be routed over the top of the backplane after the backplane is installed.

11. Align the two slots in the backplane assembly onto the two guide tabs; then, press firmly until the blue tabs latch. The backplane assembly will snap into place.

12. Reconnect the cables that were disconnected in step 4 on page 74 and step 5 on page 74.

    Note: Route cables into the cable channel (in between the fans). Do not allow any cables to catch on any metal protrusions.

PCI switch card assembly

The PCI switch card assembly, mounted on the top rear of the server frame adjacent to the adapter slots, contains one switch for each of the six adapters. This ensures that power is disconnected from the associated adapter if you attempt to open the adapter latch and remove an adapter.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove and replace the PCI switch card assembly:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

2. Remove the top cover (see "Removing the cover and bezel" on page 32).

3. Remove all full-length adapters and adapter insulators (see "Removing a PCI or PCI-X adapter" on page 36), making sure to place the adapters on a static-protective surface.

4. Disconnect the PCI switch card assembly cable from the server.

5. Grasp the two adapter switch card release latches and slide the assembly away from the server chassis; then, lift it out of the server.

   Note: The illustrations in this document might differ slightly from the hardware being serviced.
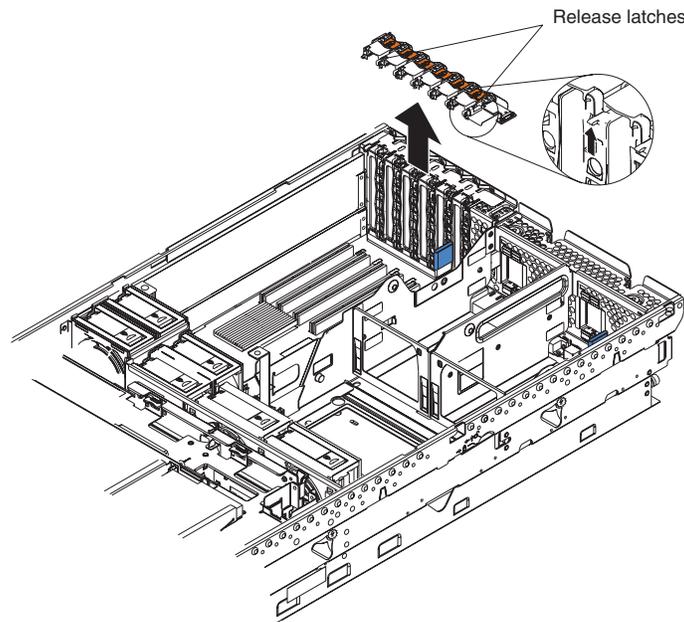
Release latches

6. To replace the PCI switch card assembly, lower the assembly into place so that the lips on the bottom of the EMI shielding material fit into the chassis at the rear of the server, and slide the card into place until the two release latches snap securely.

7. Connect the cable from the PCI switch card assembly to the I/O board and install the adapters and adapter insulators that were removed in step 3.

Adapter retainer bracket assembly

This section contains information about removing and replacing the adapter retainer bracket assembly.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove the adapter retainer bracket assembly:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

2. Remove the top cover (see "Removing the cover and bezel" on page 32).

3. Lift up the latch mechanism.

4. Remove all adapters and adapter insulators (see "Removing a PCI or PCI-X adapter" on page 36), making sure to place the adapters on a static-protective surface.

5. Disconnect one end of all cables that pass through the adapter bracket assembly; then, remove them from the routing feature of the bracket assembly and fold them out of the way.
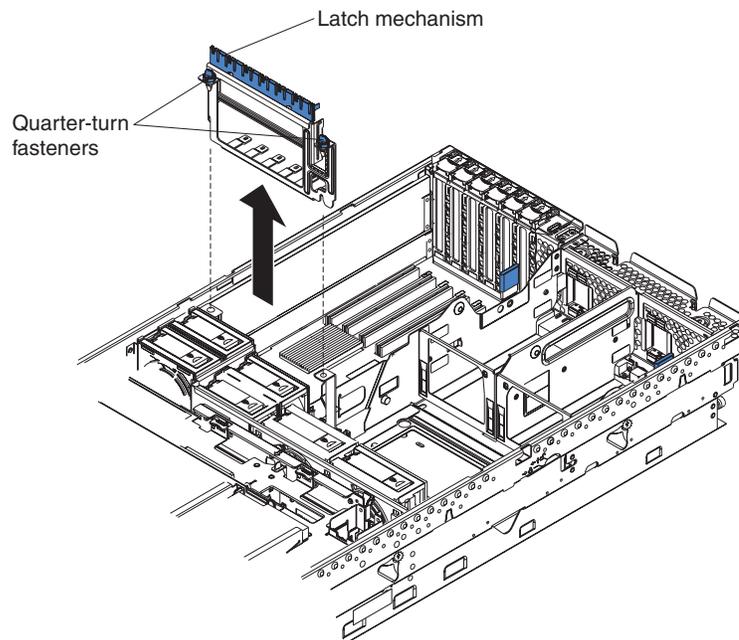
6. Turn the two blue quarter-turn fasteners to release the bracket assembly.

7. Lift the bracket assembly out of the server.

When replacing the adapter bracket assembly, complete the following steps:

1. Align the two tabs on the bracket assembly with the two slots on the chassis.

2. Set the bracket assembly firmly into place before securing the quarter-turn fasteners.

3. Reconnect the cables that were set aside in step 5 and route them back into the routing feature of the adapter retention assembly.

4. Install the adapters and insulators that were removed in step 4.

5. When replacing the insulators, make sure that:

a. The tabs on the bottom of the insulators sit in the holes in the bottom of the metal section of the bracket.

b. The tabs on the top of the insulators engage the plastic retainer section of the bracket.

Power-supply structure

This section contains information about removing and replacing the power-supply structure.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove the power-supply structure:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

2. Remove the top cover (see "Removing the cover and bezel" on page 32).

3. Remove the fans (see "Replacing a hot-swap fan" on page 55).

4. Remove the memory cassette (see "Installing a microprocessor" on page 44).

5. Remove the power supplies (see "Installing a hot-swap power supply" on page 51).

6. Pull the two blue latches (**1**) on the power-supply structure toward the front of the server; the structure will disengage from the chassis.
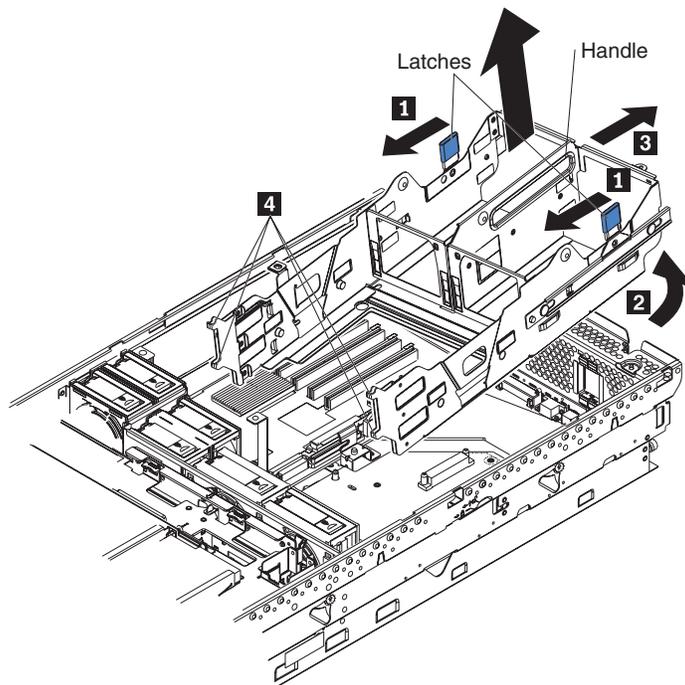
7. Grasp the handle in the middle of the structure and rotate the back of the structure up (**2**), allowing the structure to pivot at the end closest to the front of the chassis.

8. Slide the structure toward the rear of the server (**3**), disengaging the tabs on the structure from the slots in the server (**4**).

9. Lift the structure out of the server, making sure that the front alignment tabs slide clear of the chassis.

Install the power supply structure by completing the following steps:

1. Align the tabs on the structure with the notches on the chassis; then, gently lower the back of the structure into the server, making sure to line up the two posts on the floor of the chassis with the two apertures in the structure.

   Notes:

   a. The structure will fit snugly against the metal flange in the center of the I/O board and power backplane assembly.

   b. Do not allow any cables to be pinched or caught on metal protrusions.

2. Push the two blue latches of the power supply structure toward the rear of the server until they lock the structure into position.

I/O board and power backplane assembly

This section shows the locations of items on the I/O board and contains information about removing and replacing the I/O board and power backplane assembly.

Note: When replacing the I/O board, you must either update the server with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.

The I/O board and power backplane share a single metal backerplate. To replace either board, the backerplate assembly must be removed from the server.

I/O board connectors

The following illustration shows the connectors on the I/O board.
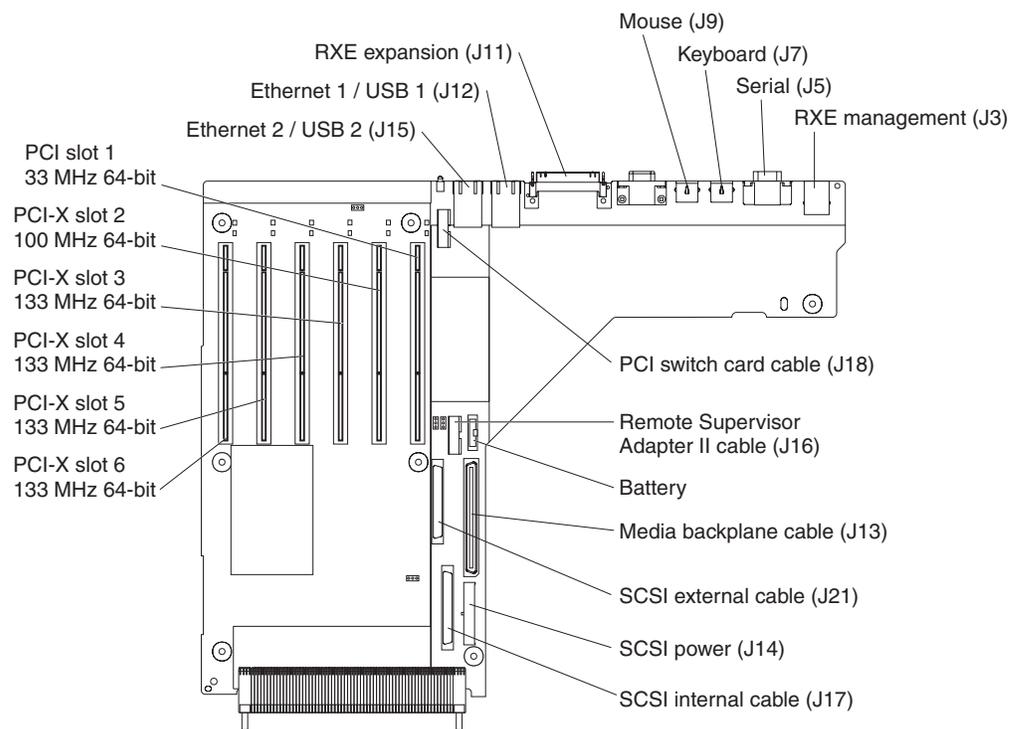
I/O board LEDs

The following illustration shows the LEDs on the I/O board.
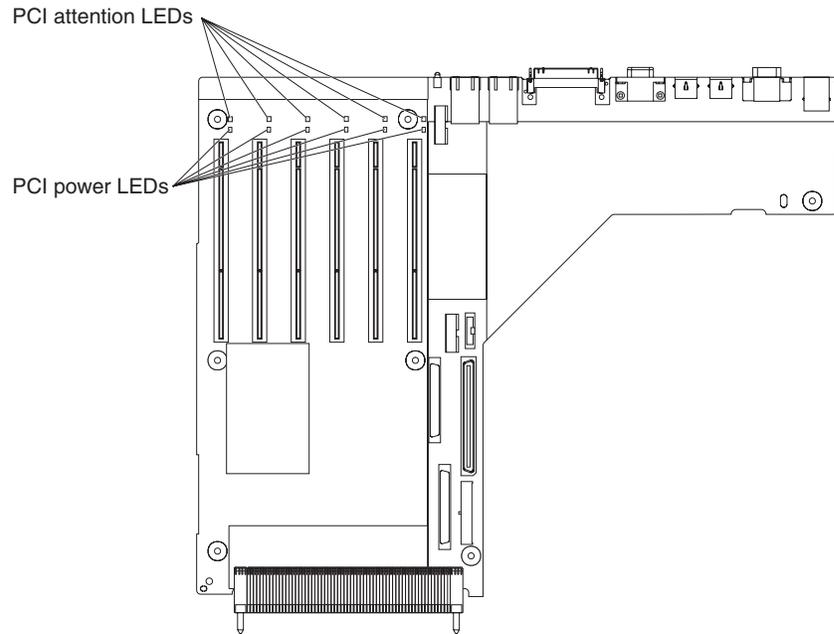
I/O board switches and jumpers

The following illustration shows the switches and jumpers on the I/O board.
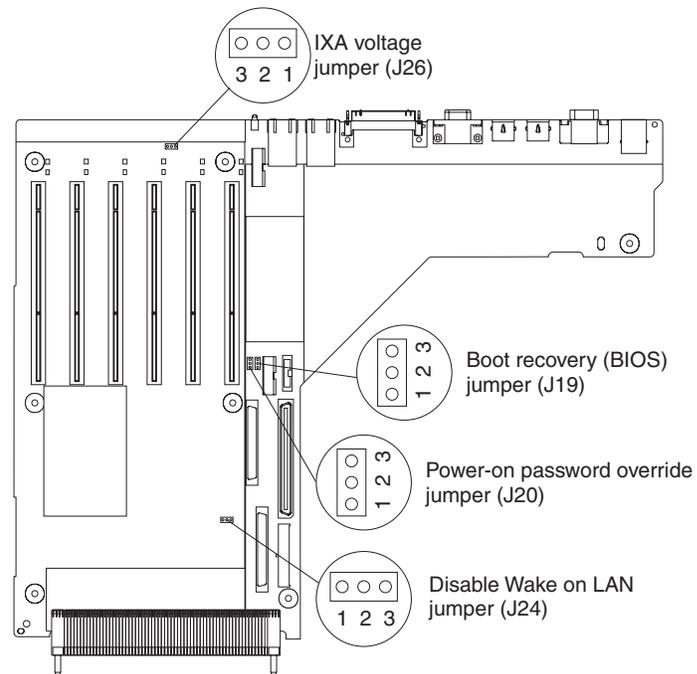
The I/O board contains three-pin jumper blocks. The following table describes the purposes of the jumpers.

Jumper name	Description
Boot recovery (BIOS) (J19)	The default position is pins 1 and 2 (use the primary boot block during startup). Move the jumper to pins 2 and 3 to use the secondary boot block during startup. For more information about recovering the BIOS code, see "Recovering BIOS code" on page 24.
Power-on password override (J20)	The default position is pins 1 and 2. Changing the position of this jumper to pins 2 and 3 bypasses the power-on password check. Changing the position of this jumper does not affect the administrator password check if an administrator password is set. If the administrator password is lost, the operator information panel must be replaced. For more information about passwords, see "Password override jumper" on page 25 and the section on using passwords in the *User's Guide* on the IBM *xSeries Documentation* CD.
Disable Wake on LAN (J24)	The default position is pins 1 and 2. Move the jumper to pins 2 and 3 to prevent a Wake on LAN (WOL) packet from waking the system when the system is in the powered-off state.
IXA voltage (J26)	The default position is pins 1 and 2. Move the jumper to pins 2 and 3 when an IXA adapter is installed in PCI slot 3.

Replacing the I/O board and power backplane assembly

This section contains information about replacing the I/O board and power backplane assembly.

Note:
- Read "Installation guidelines" on page 29.
- Read "Safety information" on page 147.
- Read "Handling static-sensitive devices" on page 30.

Complete the following steps to remove the I/O board and power backplane assembly:

1. Turn off the server and all peripheral devices; then, disconnect all power cords and external cables.

   Note: The Remote Supervisor Adapter II has external cable connections that must also be disconnected.
2. Remove the top cover (see "Removing the cover and bezel" on page 32).
3. Remove all fans.
4. Remove the memory cassette.
5. Lift the microprocessor-tray release latch.
6. Remove the microprocessor tray assembly (see "Microprocessor tray assembly" on page 68).

   Attention: The microprocessor tray is heavy. Pull the tray part-way out of the server, reposition your hands to grasp the body of the tray, and then pull the tray out the rest of the way.
7. Remove the power supplies (see steps 4a on page 52 through 4c on page 52 at "Installing a hot-swap power supply" on page 51).
8. Disconnect all cables from the I/O board.

9. Remove all adapters and adapter insulators (see "Removing a PCI or PCI-X adapter" on page 36), making sure to place the adapters on a static-protective surface.
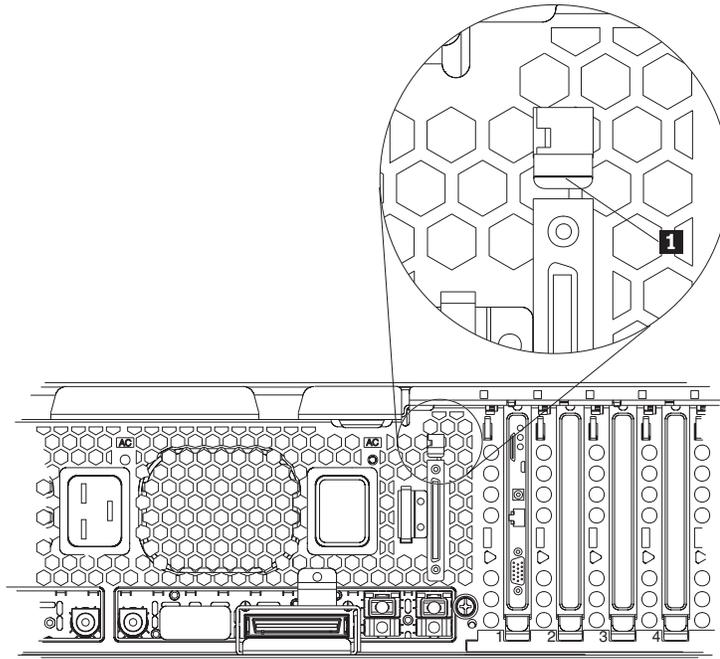
10. Remove the external SCSI cable assembly, located at the I/O port panel at the rear of the server, by pushing up on the latch clip (**1**) with a flat-bladed screwdriver to release the assembly, and then lifting it out of the server.

11. Remove the adapter retainer bracket assembly (see "Adapter retainer bracket assembly" on page 77).

12. Remove the power supply structure (see "Power-supply structure" on page 78).

13. Reach behind the server and turn the two blue captive thumbscrews to release the I/O board from the chassis.

Note: You might need a screwdriver to turn the thumbscrews.
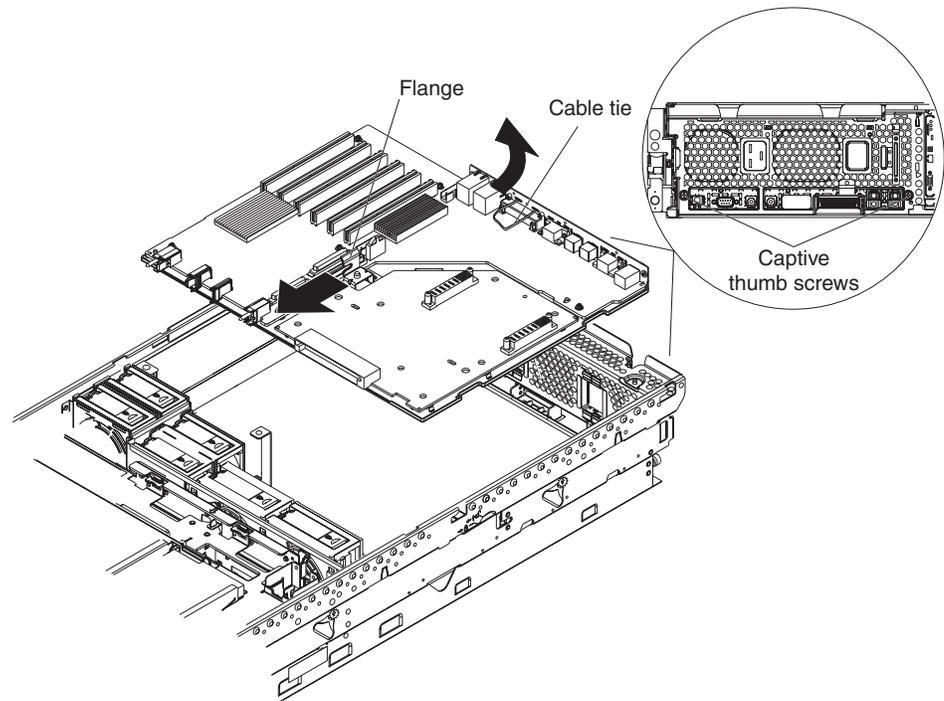
14. Grasp the metal flange (in the center of the assembly between the power backplane and the I/O board) and gently pull the assembly slightly toward the front of the server so that the two notches on each side of the assembly align with the two metal loops on each side of the chassis.

15. Grasp the cable tie and gently lift up the rear of the assembly; then, slide the front end of the assembly toward the rear of the server and lift it out of the chassis.

    Attention: When moving the assembly, do not allow it to impact any components or structures inside the server.
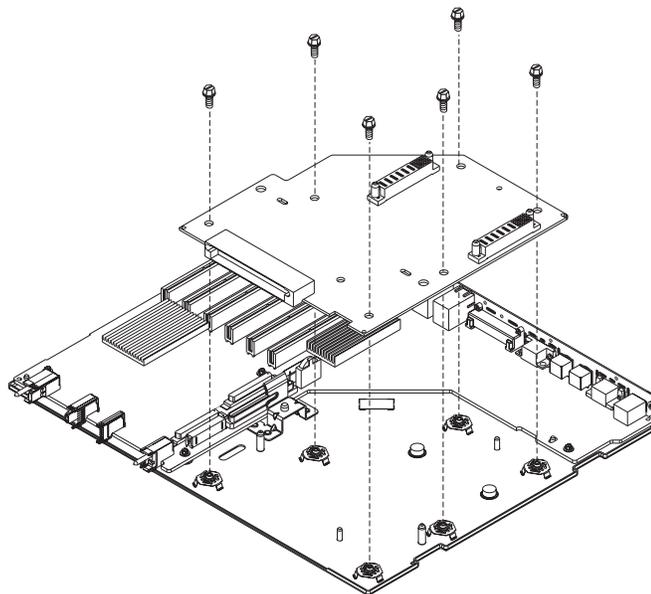
16. Set the assembly on a firm and static-protective work surface; then, remove the six screws that secure the power backplane to the backerplate and set the screws in a safe place.

   Note: Any serrated washers located at the screw holes remain in place.

17. If you are replacing the power backplane, remove the power backplane from the backerplate; then, position the replacement power backplane on the backerplate and attach it with the six screws that were removed in step 16.

   Attention: Do not overtighten the screws.

18. If you are replacing the I/O board, remove the power backplane from the backerplate and position it on the new backerplate containing the replacement I/O board; then, attach it with the six screws that were removed in step 16.

   Attention: Do not overtighten the screws.

19. Reinstall the I/O board and power backplane assembly by angling the front end of the assembly into the chassis first; then, gently slide it toward the front of the server while lowering the rear of the assembly into the chassis.

20. Align the two notches on each side of the assembly with the two metal loops on each side of the chassis.

21. Grasping the center flange, slide the assembly toward the rear of the server until it is in place.

22. Finger-tighten the two thumbscrews on the rear of the server.

   Attention: Do not overtighten the screws.

23. Replace the power supply structure (see "Power-supply structure" on page 78).

24. Continue the reassembly procedure by following steps 1 on page 81 through 11 on page 82 in reverse order.

   Notes:

   a. Be sure to route the cables in between the fans, and then through the channel with the plastic lip.

   b. The SCSI backplane cable and the external SCSI cables have similar connectors; be sure to reconnect them correctly.

   c. The cable for the Remote Supervisor Adapter II must be routed over the top of the PCI adapter insulator located closest to the center of the server. Do not route the cable underneath this insulator.

   d. Be sure to align the Remote Supervisor Adapter II cable correctly; the Remote Supervisor Adapter II is keyed to accept the cable in one direction only.

Chapter 6. Symptom-to-FRU index

This index supports xSeries 365 servers.

The symptom-to-FRU index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this Symptom-to-FRU index to help you decide which FRUs to have available when servicing the computer.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.

2. For IBM devices not supported by this index, refer to the manual for that device.

3. Always start with "General checkout" on page 15.

4. Take the action (or replace the FRU) suggested first in the list of the right column, then restart the server to see if the problem has been corrected before taking further action.

5. Try reseating a suspected component or reconnecting a cable before replacing the component.

POST error codes and messages are displayed on the screen.

Beep symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the following examples.

Beeps	Description
1-2-3	• One beep • A pause (or break) • Two beeps • A pause (or break) • Three beeps
4	Four continuous beeps

One beep after successfully completing POST indicates that the server is functioning correctly.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Beep/symptom	**FRU/action**
1-1-3 (CMOS write/read test failed)	1. **Battery** 2. I/O board
1-1-4 (BIOS ROM checksum failed)	• **I/O board**
1-2-1 (Programmable Interval Timer failed)	• **I/O board**
1-2-2 (DMA initialization failed)	• **I/O board**
1-2-3 (DMA page register write/read failed)	• **I/O board**
1-2-4 (RAM refresh verification failed)	1. **DIMM** 2. Memory cassette
1-3-1 (1st 64K RAM test failed)	1. **DIMM** 2. Memory cassette
2-1-1 (Secondary DMA register failed)	• **I/O board**
2-1-2 (Primary DMA register failed)	• **I/O board**
2-1-3 (Primary interrupt mask register failed)	• **I/O board**
2-1-4 (Secondary interrupt mask register failed)	• **I/O board**
2-2-2 (Keyboard controller failed)	• **I/O board**
3-1-1 (Timer tick interrupt failed)	• **I/O board**
3-1-2 (Interval timer channel 2 failed)	• **I/O board**
3-1-4 (Time-of-Day clock failed)	1. **Battery** 2. I/O board

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Beep/symptom	**FRU/action**
3-3-2 (Critical SMBUS error occurred)	1. **Disconnect power cord, wait 30 seconds, retry**. 2. DIMM. 3. Memory cassette. 4. Microprocessor tray assembly. 5. I/O board.
3-3-3 (No operational memory in system)	1. **Verify that lower SMP Expansion Module contains correct number of DIMMs; install or reseat DIMMS, then reboot.** 2. DIMM. 3. Memory cassette. 4. Microprocessor tray assembly.
Two short beeps (information only, configuration has changed)	1. **Run Configuration/Setup.** 2. Run diagnostic programs.
Three short beeps	1. **DIMM** 2. Memory cassette 3. Microprocessor tray assembly
One continuous beep	1. **Microprocessor** 2. Optional microprocessor 3. Microprocessor tray assembly
Repeating short beeps	1. **Keyboard** 2. I/O board
Repeating long beeps	• **Reseat DIMMs.**
One long and one short beep	1. **I/O board** 2. Center plane
One long and two short beeps	• **I/O board**
Two long and two short beeps	• **I/O board**

No beep symptoms

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
No beep symptom	**FRU/action**
No beep and the system operates correctly.	• **Operator information panel**
No beeps occur after successfully completing POST (Power-On Status is disabled.)	1. **Run Configuration/Setup, set the Start Options Power-On Status to enable.** 2. Operator information panel.
No ac power (Power supply ac LED is off)	1. **Check the power cord.** 2. Power supply (if two are installed, swap them to determine if one is defective.) 3. Power backplane
No beep and no video	• **See "Undetermined problems" on page 136.**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
No beep symptom	**FRU/action**
System will not power-up (Power supply ac LED is on)	• **See "Power LED errors" on page 130.**

POST error codes

In the following error codes, X can be any number or letter.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
062 (Three consecutive boot failures using the default configuration.)	1. **Flash system to latest level.** 2. I/O board.
101, 102 (Tick timer internal interrupt, internal timer channel 2)	• **I/O board**
106 (Diskette controller failure)	• **I/O board**
114 (Adapter read-only memory (ROM) error)	1. **Remove adapters and reinstall one at a time; replace failing adapter.** 2. I/O board.
151 (Real time clock error)	1. **Battery** 2. I/O board
161 (Real time clock battery error)	1. **Battery** 2. I/O board
162 (Device Configuration Error) **Note:** Be sure to load the default settings and any additional desired settings; then, **save the configuration**	1. **Run Configuration/Setup** 2. Battery 3. Failing device 4. I/O board
163 (Real-Time Clock error)	1. **Run Configuration/Setup.** 2. Battery. 3. I/O board.
175 (Hardware error)	1. **I/O board** 2. Service processor
177, 178 (Security hardware error)	1. **Run Configuration/Setup.** 2. I/O board. 3. Service processor.
184 (Power-on password corrupted)	1. **Run Configuration/Setup.** 2. Battery. 3. I/O board.
186 (Security hardware control logic failed)	1. **Run Configuration/Setup.** 2. I/O board. 3. Service processor.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
187 (VPD serial number not set.)	1. **Set serial number using flash update utility.** 2. I/O board. 3. Service processor.
188 (Bad EEPROM CRC #2)	1. **Run Configuration/Setup.** 2. I/O board. 3. Service processor.
189 (An attempt was made to access the server with invalid passwords)	• **Run Configuration/Setup, enter the administrator password.**
289 (DIMM has been disabled by the user or system)	1. **Run Configuration/Setup, if disabled by user.** 2. Verify proper DIMM installation (see "Memory modules" on page 39). 3. Disabled DIMM, if not disabled by user.
301 (Keyboard or keyboard controller error) **Note:** After installing a USB keyboard, you might need to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup.	1. **Keyboard** 2. I/O board
303 (Keyboard controller error)	1. **I/O board** 2. Keyboard
602 (Invalid diskette boot record)	1. **Diskette** 2. Diskette drive 3. Cable 4. I/O board
604 (Diskette drive error)	1. **Run Configuration/Setup and diagnostic programs.** 2. Diskette drive. 3. Drive cable. 4. I/O board.
662 (Diskette drive configuration error)	1. **Run Configuration/Setup and diagnostic programs.** 2. Diskette drive. 3. Drive cable. 4. I/O board.
1600 (Service processor not functioning)	1. **Cable connecting service processor with I/O board.** 2. Service processor.
1762 (Fixed Disk Configuration error)	1. **Hard disk drive cables.** 2. Run Configuration/Setup. 3. Hard disk drive adapter. 4. Hard disk drive. 5. SCSI backplane. 6. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
178x (Fixed Disk error)	1. **Hard disk drive cables.** 2. Run diagnostic programs. 3. Hard disk drive adapter. 4. Hard disk drive. 5. I/O board.
1800 (Unavailable PCI hardware interrupt)	1. **Run Configuration/Setup and adjust adapter settings.** 2. Remove an adapter.
1962 (Drive does not contain a valid boot sector)	1. **Verify a bootable operating system is installed.** 2. Run diagnostic programs. 3. Hard disk drive. 4. SCSI backplane. 5. Cable. 6. I/O board.
5962 (IDE CD-ROM configuration error)	1. **Run Configuration/Setup.** 2. CD-ROM drive. 3. IDE cable. 4. I/O board.
8603 (Pointing Device Error)	1. **Pointing device** 2. I/O board
0001295 (ECC circuit check)	1. **DIMM** 2. Microprocessor tray assembly
00012000 (Processor machine check error)	1. **Microprocessor** 2. Microprocessor tray assembly
00019501 (Processor 1 is not functioning - check VRM and processor LEDs)	1. **Microprocessor 1** 2. Microprocessor tray assembly
00019502 (Processor 2 is not functioning - check VRM and processor LEDs)	1. **Microprocessor 2** 2. Microprocessor tray assembly
00019503 (Processor 3 is not functioning - check VRM and processor LEDs)	1. **VRM 3** 2. Microprocessor 3 3. Microprocessor tray assembly
00019504 (Processor 4 is not functioning - check VRM and processor LEDs)	1. **VRM 4** 2. Microprocessor 4 3. Microprocessor tray assembly
00019701 (Processor 1 failed BIST)	1. **Microprocessor 1** 2. Microprocessor tray assembly
00019702 (Processor 2 failed BIST)	1. **Microprocessor 2** 2. Microprocessor tray assembly
00019703 (Processor 3 failed BIST)	1. **Microprocessor 3** 2. VRM3 3. Microprocessor tray assembly

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
00019704 (Processor 4 failed BIST)	1. **Microprocessor 4** 2. VRM4 3. Microprocessor tray assembly
00180100 (A PCI adapter has requested memory resources that are not available)	1. **Reorder the adapters in the PCI slots. It is important that your boot device is positioned early in the scan order so that it is executed by POST.** 2. Verify that the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program. If the memory resource settings are not correct, change the settings. 3. If all memory resources are being used, you might need to remove an adapter to make memory available to the PCI adapter. Disabling the adapter BIOS on the adapter should correct the error. Refer to documentation provided with the adapter.
00180200 (No more I/O space available for PCI adapter)	1. **Run Configuration/Setup.** 2. Failing adapter. 3. I/O board.
00180300 (No more memory (above 1MB for PCI adapter))	1. **Run Configuration/Setup.** 2. Failing adapter. 3. I/O board.
00180400 (No more memory (below 1MB for PCI adapter))	1. **Run Configuration/Setup.** 2. Failing adapter. 3. I/O board.
00180500 (PCI option ROM checksum error)	1. **Remove failing PCI card.** 2. I/O board.
00180600 (PCI built-in self test failure)	1. **Run Configuration/Setup.** 2. Failing adapter. 3. I/O board.
00180700, 00180800 (General PCI error)	1. **Verify that no devices have been disabled in CMOS.** 2. I/O board. 3. PCI card
00181000 (PCI error)	1. **Remove adapters in PCI slots.** 2. I/O board.
00181100 (RXE100 communication error)	1. **Check RXE-100 drawer management cable (RS-485).** 2. Check service processor in host. 3. Verify DMC code level in RXE-100.
00181200 (RXE-100 requested slots unavailable)	1. **Release slots from other shared host.** 2. Verify code level in RXE-100. 3. Verify slot request in Configuration/Setup Utility program. 4. Check RIOG cable.
01295085 (ECC checking hardware test error)	1. **Microprocessor** 2. DIMM 3. Microprocessor tray assembly

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
01298001 (No update data for processor 1)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 1.
01298002 (No update data for processor 2)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 2.
01298004 (No update data for processor 3)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 3.
01298005 (No update data for processor 4)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 4.
01298101 (Bad update data for processor 1)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 1.
01298102 (Bad update data for processor 2)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 2.
01298103 (Bad update data for processor 3)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 3.
01298104 (Bad update data for processor 4)	1. **Ensure all microprocessors are the same cache size.** 2. Reflash BIOS code. 3. Microprocessor 4.
0I298200 (Processor speed mismatch)	• **Ensure all microprocessors are the same cache size.**
I9990301 (Fixed disk sector error)	1. **Hard disk drive** 2. SCSI backplane 3. Cable 4. I/O board
I9990305 (Operating system not found)	1. **Verify a bootable operating system is installed.** 2. Run diagnostic programs. 3. Hard disk drive. 4. SCSI backplane. 5. Cable. 6. I/O board.
I9990650 (AC power has been restored)	1. **Check cables.** 2. Check for interruption of power supply. 3. Power cable. 4. Power backplane.

Light path LED errors

Before replacing any FRU:

1. Observe LEDs on boards.
2. View system-error log.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Light path LED	**FRU/action**
All LEDs off (error log full) **Note:** "Information" LED may be lit.	1. **System-Error log is 75% full; analyze the log entries to determine the nature of the error messages.** 2. Save and/or clear the log. 3. For a PFA alert, check error log for failures. 4. To clear a PFA alert; remove ac power for at least 20 seconds; then, reconnect and power up system.
PS1	1. **Power supply 1** 2. Power backplane
PS2	1. **Power supply 2** 2. Power backplane

TEMP (temperature too high)	1. **Check the following LEDs:**
	    a. If a fan LED is on, replace the fan.
	    b. If a power supply fan LED is on, replace the power supply.
	2. Ambient temperature must be within normal operating specifications. See "Features and specifications" on page 3
	3. Examine System Error log.
	    a. System over recommended temperature
	    b. DASD over recommended temperature
	        1) Overheating hard disk drive
	        2) DASD backplane
	    c. Microprocessor x over recommended temperature (where x is microprocessor number)
	        1) Reseat microprocessor x and heat sink.
	        2) Microprocessor x.
	    d. Power supply fault / over temp
	        • Failing power supply
	    e. Operator information panel

FAN (fan failure)
Note: A failing fan can also cause the OVER TEMP and DASD LEDs to be on.
	1. **Check the following LEDs:**
	    a. If an individual fan LED is on, replace the fan.
	    b. If an individual power supply fan LED is on, replace the power supply.
	2. Microprocessor tray assembly.

VRM (VRM failure)	1. **Check event log to determine location of failing LED (VRM).** 2. VRM 3-4. 3. Microprocessor tray assembly.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Light path LED	**FRU/action**
CPU (failed microprocessor) **Note:** Verify correct installation sequence; see "Installing a microprocessor" on page 44.	1. **Check event log to determine location of failing LED (microprocessor).** 2. Find failing microprocessor by checking LEDs on microprocessor tray assembly. **Note:** If LED is not visible with microprocessor tray assembly installed, remove assembly and light the failing microprocessor's LED by pressing the light path diagnostics button (see "Installing a microprocessor" on page 44). 3. Microprocessor 1-4. 4. Microprocessor tray assembly.
PCI (fault on PCI)	1. **Check System Error log.** 2. Failing adapter. 3. I/O board.
MEM (memory failure)	1. **Check event log to determine location of failing LED (DIMM).** 2. DIMM. 3. Memory cassette.
DASD (fault in hard disk drive or SCSI backplane) **Note:** If RAID system, refer to Hardware Maintenance Manual for the specific RAID adapter.	1. **Failing drive (reseat/replace).** 2. Be sure the fans are operating correctly and the air flow is good. 3. SCSI backplane.
NR (nonredundancy lost) **Note:** "Information" LED may also be lit.	1. **If PS x LED is lit on light path diagnostics panel, follow instructions for that LED.** 2. Failing power supply.
NMI (nonmaskable interrupt) **Note:** PCI or MEM LEDs may also be lit.	1. **See System-Error log.** 2. If a PCI LED is on, follow the instructions for that LED. 3. If MEM LED is on, follow the instructions for that LED. 4. Restart the server.
SP (service processor fault)	1. **See System-Error log.** 2. Remote Supervisor Adapter II (reseat/replace). 3. I/O board.
EXP (device in remote expansion enclosure has failed) **Notes:** 1. If the amber status LED is on indicating a problem with a device in the remote expansion enclosure, replace the device. 2. Check server error log for indications of a failure in a device installed in the remote expansion enclosure or in the expansion enclosure itself. If the log indicates a problem in the expansion enclosure, see the problem-solving information in the expansion enclosure documentation.	1. Check System-Error log (if log indicates a temperature problem and fans are working correctly, check for air flow blockage). 2. Check light path on remote expansion enclosure. 3. Replace indicated device.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Light path LED	**FRU/action**
LOG (non-optimal condition)	1. **See System Error log.** 2. See Service Processor log.
OVER SPEC (power supplies are being overdriven)	1. **Power supply** 2. Power backplane

Diagnostic error codes

Note: In the following error codes, if xxx is 000, 195, or 197, *do not* replace a FRU. The description for these error codes are:

000 The server passed the test.

195 The Esc key was pressed to end the test.

197 This is a warning error and might not indicate a hardware failure.

For all error codes, replace the FRU or follow the action indicated.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
001-198-000 (Test Aborted)	1. **Check error log for messages.** 2. Run Quick Memory Test All Banks. 3. Reload server BIOS code and rerun test.
001-250-00x (Test Failed) x of 0 = ECC logic on I/O board; x of 1 = ECC logic on memory board	1. **Check error log for messages.** 2. Run Quick Memory Test All Banks. 3. Rerun ECC test. 4. Memory cassette. 5. I/O board.
001-292-000 (Core system: failed/CMOS checksum failed)	**Load BIOS defaults and rerun test.**
001-xxx-000 (Failed core tests)	• **I/O board**
001-xxx-001 (Failed core tests)	• **I/O board**
005-xxx-000 (Failed Video test)	• **I/O board**
011-xxx-000 (Failed COM1 Serial Port test)	• **I/O board**
015-xxx-001 (Failed USB test)	• **I/O board**
015-xxx-015 (Failed USB external loopback test)	• **I/O board**
015-xxx-198 (Remote Supervisor Adapter II installed) *or* (USB device connected during USB test)	1. **If Remote Supervisor Adapter II is installed as an option, remove it and rerun test.** **Note:** If Remote Supervisor Adapter II is present as a standard installation, do not remove it; the test cannot be run. 2. Remove USB devices and rerun test. 3. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
020-xxx-000 (Failed PCI Interface test)	1. **PCI switch card assembly** 2. I/O board
020-xxx-001 (Failed Hot-Swap Slot 1 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
020-xxx-002 (Failed Hot-Swap Slot 2 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
020-xxx-003 (Failed Hot-Swap Slot 3 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
020-xxx-004 (Failed Hot-Swap Slot 4 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
020-xxx-005 (Failed Hot-Swap Slot 5 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
020-xxx-006 (Failed Hot-Swap Slot 6 PCI Latch test)	1. **PCI hot-swap latch assembly** 2. PCI switch card assembly
030-xxx-000 (Failed Internal SCSI interface test)	1. **Make sure SCSI is not enabled, rerun test.** 2. I/O board.
030-xxx-00n (Failed SCSI test on PCI slot n. Check system error log before replacing a FRU.)	• **Adapter in slot n**
035-002-0nn (ServeRAID interface timeout)	1. **ServeRAID controller may not be configured properly.** Obtain the basic and extended configuration status bytes and see the ServeRAID Hardware Maintenance Manual for more information. 2. Cable. 3. SCSI backplane. 4. ServeRAID controller.
035-253-0nn (ServeRAID controller 0nn initialization failure; 0nn = the controller number)	1. **ServeRAID controller may not be configured properly.** Obtain the basic and extended configuration status bytes and see the ServeRAID Hardware Maintenance Manual for more information. 2. Cable. 3. SCSI backplane. 4. ServeRAID controller.
035-253-s99 (RAID adapter initialization failure)	1. **ServeRAID adapter** 2. SCSI cable
035-254-0nn (Setup error - unable to allocate memory to run test.)	• **Check system resources.**
035-255-0nn (Internal Error)	1. **SCSI backplane** 2. Cable
035-260-0nn (System to controller interface failure)	1. **ServeRAID adapter** 2. I/O board

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Error code/symptom	FRU/action
035-xxx-cnn (Check System error Log before replacing a FRU. c = ServeRAID channel number, nn = SCSI ID of failing fixed disk drive.)	• **Hard disk drive on channel C, SCSI ID nn**
035-xxx-snn (Check System Error Log before replacing a FRU. nn = SCSI ID of failing fixed disk.)	• **SCSI disk with ID nn on adapter in slot s**
075-xxx-000 (Failed power supply test)	1. **Power supply** 2. Power backplane
089-xxx-001 (Failed Microprocessor test)	1. **Microprocessor 1** 2. Microprocessor tray assembly
089-xxx-002 (Failed Optional Microprocessor test)	1. **Microprocessor 2** 2. Microprocessor tray assembly
089-xxx-003 (Failed Microprocessor test)	1. **Microprocessor 3** 2. VRM 3 3. Microprocessor tray assembly
089-xxx-004 (Failed Microprocessor test)	1. **Microprocessor 4** 2. VRM 4 3. Microprocessor tray assembly
091-09x-041 (RXE Expansion Port failure; valid only with RXE cable) (where x of 4 = cable or initialization error; x of 5 = transmit error; x of 6 = receive error; x of 7 = ping error, below threshold)	1. **RXE cable** 2. I/O board
091-09x-056 (RXE100 Side A Port failure) (where x of 4 = cable or initialization error; x of 5 = transmit error; x of 6 = receive error; x of 7 = ping error, below threshold)	1. **RXE cable** 2. RXE Expansion board to which cable is connected (Side A or Side B) 3. I/O board
091-09x-057 (RXE100, from Side A to Side B failure) (where x of 4 = cable or initialization error; x of 5 = transmit error; x of 6 = receive error; x of 7 = ping error, below threshold)	1. **Side A card in RXE100** 2. Side B card in RXE100
091-09x-058 (RXE100 Side B Port failure) (where x of 4 = cable or initialization error; x of 5 = transmit error; x of 6 = receive error; x of 7 = ping error, below threshold)	1. **RXE cable** 2. RXE Expansion board to which cable is connected (Side A or Side B) 3. I/O board
091-09x-059 (RXE100, from Side B to Side A failure) (where x of 4 = cable or initialization error; x of 5 = transmit error; x of 6 = receive error; x of 7 = ping error, below threshold)	1. **Side B card in RXE100** 2. Side A card in RXE100
155-xxx-xxx (Failed Active Memory™ latch test)	1. **Memory cassette cover assembly** 2. Memory cassette

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
166-051-000 System Management: Failed (Unable to communicate with ASM. It may be busy. Run the test again.)	1. **Flash latest levels of firmware (BIOS, service processor, diagnostics)** 2. Rerun diagnostic test. 3. Correct other error conditions (including failed system management tests and items logged in Remote Supervisor Adapter system error log and retry.) 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter.
166-060-000 System Management: Failed (Unable to communicate with ASM. It may be busy. Run the test again.)	1. **Flash latest levels of firmware (BIOS, service processor, diagnostics)** 2. Rerun diagnostic test. 3. Correct other error conditions (including failed system management tests and items logged in Remote Supervisor Adapter system error log and retry.) 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter.
166-070-000 System Management: Failed (Unable to communicate with ASM. It may be busy. Run the test again.)	1. **Flash latest levels of firmware (BIOS, service processor, diagnostics)** 2. Rerun diagnostic test. 3. Correct other error conditions (including failed system management tests and items logged in Remote Supervisor Adapter system error log and retry.) 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter.
166-198-000 (BIOS cannot detect ASM. Reseat ASM adapter in correct slot) (ASM restart failure. Unplug and cold boot server to reset ASM)	1. **Rerun diagnostic test.** 2. Correct other error conditions (including other failed system management tests and items logged in Remote Supervisor Adapter system error log) and retry. 3. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 4. Remote Supervisor Adapter. 5. I/O board.
166-201-000 (ISMP indicates I2C errors on bus X)	• **I/O board**
166-201-001 (ISMP indicates I2C errors on bus P)	1. **Power backplane** 2. I/O board 3. Microprocessor tray assembly
166-201-002 (ISMP indicates I2C errors on bus I)	• **I/O board**
166-201-003 (ISMP indicates I2C errors on bus C)	1. **Microprocessor tray assembly** 2. I/O board

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
166-201-004 (ISMP indicates I2C errors on bus M)	1. **I/O board** 2. Memory cassette 3. Microprocessor tray assembly
166-201-005 (ISMP indicates I2C errors on bus S)	1. **SCSI backplane** 2. I/O board
166-201-006 (ISMP indicates I2C errors on bus O)	1. **Operator information panel** 2. I/O board
166-201-007 (ISMP indicates I2C errors on bus M0)	1. **Memory cassette** 2. I/O board 3. Microprocessor tray assembly
166-201-008 (ISMP indicates I2C errors on bus M1)	1. **Memory cassette** 2. I/O board 3. Microprocessor tray assembly
166-201-100 (ISMP indicates I2C errors on RXE bus X)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-101 (ISMP indicates I2C errors on RXE bus P)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-102 (ISMP indicates I2C errors on RXE bus I_A)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-103 (ISMP indicates I2C errors on RXE bus I_B)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-104 (ISMP indicates I2C errors on RXE bus PCI_A)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-105 (ISMP indicates I2C errors on RXE bus F)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-106 (ISMP indicates I2C errors on RXE bus PCI_B)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-107 (ISMP indicates I2C errors on RXE bus PCI_A slot 1)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-108 (ISMP indicates I2C errors on RXE bus PCI_A slot 2)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-109 (ISMP indicates I2C errors on RXE bus PCI_A slot 3)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-110 (ISMP indicates I2C errors on RXE bus PCI_A slot 4)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-111 (ISMP indicates I2C errors on RXE bus PCI_A slot 5)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-112 (ISMP indicates I2C errors on RXE bus PCI_A slot 6)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.
166-201-113 (ISMP indicates I2C errors on RXE bus PCI_B slot 1)	• See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
166-201-114 (ISMP indicates I2C errors on RXE bus PCI_B slot 2)	• **See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.**
166-201-115 (ISMP indicates I2C errors on RXE bus PCI_B slot 3)	• **See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.**
166-201-116 (ISMP indicates I2C errors on RXE bus PCI_B slot 4)	• **See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.**
166-201-117 (ISMP indicates I2C errors on RXE bus PCI_B slot 5)	• **See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.**
166-201-118 (ISMP indicates I2C errors on RXE bus PCI_B slot 6)	• **See *Hardware Maintenance Manual* for IBM RXE-100 Remote Expansion Enclosure.**
166-260-000 (ASM restart failure)	1. **Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.** 2. Remote Supervisor Adapter.
166-342-000 (System Management BIST indicates failed tests)	1. **Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.** 2. Remote Supervisor Adapter.
166-400-000 (ISMP Self Test Result failed tests: xxx) where xxx=flash, ROM, or RAM	1. **Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.** 2. (Re)flash ISMP with latest firmware level. 3. I/O board.
166-400-100 (DMC Self Test Result failed tests: xxx) where xxx=flash, ROM, or RAM	1. **Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.** 2. (Re)flash ISMP on RXE with latest firmware level. 3. RXE backplane.
180-197-000 (SCSI ASPI driver not installed)	1. **Remove RAID adapter, if installed, and rerun test.** 2. SCSI backplane. 3. I/O board. 4. Microprocessor tray assembly.
180-361-003 (Failed Fan LED test)	1. **Fan** 2. I/O board
180-xxx-000 (Diagnostics LED failure)	• **Run diagnostic LED test for failing LED.**
180-xxx-001 (Failed Front LED Panel test)	1. **Operator information panel cable** 2. Operator information panel 3. I/O board 4. Microprocessor tray assembly
180-xxx-002 (Failed Diagnostics LED Panel test)	1. **Operator information panel cable** 2. Operator information panel 3. I/O board 4. Microprocessor tray assembly

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
180-xxx-005 (Failed SCSI Backplane LED test)	1. **SCSI backplane cable** 2. SCSI backplane 3. I/O board 4. Microprocessor tray assembly
180-xxx-006 (Failed Memory Board LED test)	1. **Memory cassette** 2. Microprocessor tray assembly 3. I/O board
180-xxx-007 (Failed Power Supply Fan LED test)	1. **Power supply** 2. Power supply structure 3. I/O board
180-xxx-008 (Failed I/O board LED test)	• **I/O board**
180-xxx-009 (Failed Active PCI™ LED test)	1. **PCI switch card assembly** 2. I/O board
201-xxx-Ynn (failed Memory Test; see "Memory modules" on page 39) **Note:** nn = DIMM 1-16 [Port 1: DIMMs 9-16; Port 2: DIMMs 1-8].	1. **Replace DIMM nn [nn = 1-16].** 2. Replace memory cassette.

201-XXX-Y21 (Multiple DIMM failure in Port 1 Bank 1; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	  a. Replace a DIMM in bank with a ″known good″ DIMM.
	  b. Rerun memory diagnostic for the failing bank.
	  c. If test fails, mark replaced DIMM as ″good″ DIMM.
	  d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	  e. If DIMM tested is ″bad″, remove it and replace it.
	  f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

201-XXX-Y22 (Multiple DIMM failure in Port 1 Bank 2; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	  a. Replace a DIMM in bank with a ″known good″ DIMM.
	  b. Rerun memory diagnostic for the failing bank.
	  c. If test fails, mark replaced DIMM as ″good″ DIMM.
	  d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	  e. If DIMM tested is ″bad″, remove it and replace it.
	  f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**

201-XXX-Y23 (Multiple DIMM failure in Port 1 Bank 3; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

201-XXX-Y24 (Multiple DIMM failure in Port 1 Bank 4; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

201-XXX-Y31 (Multiple DIMM failure in Port 2 Bank 1; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

201-XXX-Y32 (Multiple DIMM failure in Port 2 Bank 2; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**

201-XXX-Y33 (Multiple DIMM failure in Port 2 Bank 3; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

201-XXX-Y34 (Multiple DIMM failure in Port 2 Bank 4; see "Memory modules" on page 39)	1. **Isolate failing DIMM:**
	   a. Replace a DIMM in bank with a ″known good″ DIMM.
	   b. Rerun memory diagnostic for the failing bank.
	   c. If test fails, mark replaced DIMM as ″good″ DIMM.
	   d. If test passes, mark replaced DIMM as ″bad″ DIMM.
	   e. If DIMM tested is ″bad″, remove it and replace it.
	   f. If DIMM tested is ″good″, do not replace it.
	2. Repeat steps 1a through 1f with other DIMMs in failing bank until error is fixed.
	3. If error is not fixed, replace memory cassette.

202-xxx-00n (Failed System Cache test)	1. **Microprocessor n** 2. SMP board
204-198-000 (Test Aborted)	1. **Run Quick Memory Test Diagnostic All Banks.** 2. System BIOS code problem; see PCDR log. 3. Memory cassette.
204-210-000 (Test Failed)	1. **Run Quick Memory Test Diagnostic All Banks.** 2. If test runs without failure, update system BIOS code. 3. Memory cassette.
206-xxx-000 (Failed Diskette Drive test)	1. **Rerun test with a different diskette.** 2. Diskette drive 3. Media Bay card
215-xxx-000 (Failed CD-ROM test)	1. **Rerun test with a different CD.** 2. CD-ROM drive 3. Media Bay card
217-xxx-000 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 1**
217-xxx-001 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 2**
217-xxx-002 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 3**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
217-xxx-003 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 4**
217-xxx-004 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 5**
217-xxx-005 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 6**
217-xxx-006 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 7**
217-xxx-007 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 8**
217-xxx-008 (Failed BIOS Fixed Disk test) **Note:** If RAID is configured, the fixed disk number refers to the RAID logical array.	• **Hard disk drive 9**
217-198-xxx (Could Not Establish Drive Parameters)	1. **Check drive cables and terminators** 2. Hard disk drive
264-xxx-0nn (Failed Tape Drive test)	1. **Tape cartridge** 2. Tape drive 3. Tape drive SCSI cable
264-xxx-999 (nn = SCSI ID of failing Tape Drive)	1. **Tape cartridge,** if user executed the Read/Write Tape Drive test (xxx = 256) 2. SCSI or power cable connected to the tape drive with SCSI ID nn 3. Tape drive with SCSI ID nn (refer to Help and Service Information appendix of tape drive's User Guide) 4. SCSI controller (run SCSI controller diagnostic to determine of SCSI bus is functioning properly.)
301-xxx-000 (Failed Keyboard test) **Note:** After installing a USB keyboard, you might need to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup.	1. **Keyboard** 2. I/O board
302-xxx-xxx (Failed mouse test)	1. **Mouse** 2. I/O board
305-xxx-xxx (Failed video monitor test)	1. **Video monitor** 2. I/O board
405-xxx-000 (Failed Ethernet test on controller on I/O board)	1. **Verify that Ethernet is not disabled in BIOS.** 2. Run loopback diagnostic. 3. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
405-xxx-00n (No good link! Check loopback plug)	1. **Verify that the loopback plug is a gigabit loopback plug (see "Ethernet controller troubleshooting" on page 27).** 2. Check for any loose connections between the loopback plug and the ethernet port.
415-xxx-000 (Failed Modem test)	• **Modem**

System-error log entries

The system-error log is similar to an event log and can contain messages of three major types:

Information   Information messages do not require action and record significant system-level events. Example: 'System Complex Powered Up'

Warning   Warning messages indicate possible problems but do not require immediate action. Example: 'System over recommended ambient temperature'

Error   Error messages indicate system errors that may require attention. Example: 'Fan 2 not detected'

System-error log messages can originate from several sources.
* POST/BIOS
* SMI handler
* Service processor

Each entry contains date and time information, which is useful in determining the nature of the occurrence.

SMI handler messages

SMI handler is special system code that provides system monitoring functions.

When the SMI handler detects a microprocessor error, the SMI handler message identifies the affected processor using a ProcID number or an APICID number. The following table provides a cross reference between the physical microprocessor number, the ProcID and the APICID.

Physical Microprocessor Number[1]	ProcID	APICID
1	01	0000 or 0001
2	02	0002 or 0003
3	03	0004 or 0005
4	04	0006 or 0007
[1] See "Microprocessor board connectors, jumpers and LEDs" on page 68 to find the physical microprocessor numbering		

Following is an example of an SMI handler message:

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Date/Time: 2002/05/08 03:35:30
DMI Type: 00
Source: SMI Hdlr
Error Code: 00150700 PERR: Slave signaled parity error
Error Code:
Error Data: Bus = 02, Slot = 01, VendID = 1014, DevID = 0302
Error Data:
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

This message indicates that a PCI Bus 02 parity error occurred at the recorded time. All of the SMI handler message codes are listed in the following table.

Note: The message codes in the following table do not include leading or trailing zeros.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
SMI message code	**Suggested action**
1500 (Single bit error occurred: begin scrub)	• **Information only; run memory diagnostic programs when multiple entries accumulate.**
1501 (Multi-bit error occurred: forcing NMI)	• **Run memory diagnostic programs; then, replace indicated memory DIMM.**
1502 (SERR: Addr. or Spec. Cyc. DPE)	1. **Check Operating System event log.** 2. Run adapter diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

SMI message code	Suggested action
1503 (SERR: Received Target Abort)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1504 (SERR: Device Signaled SERR)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1505 (PERR: Master Read parity error)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1506 (PERR: Master Write parity error)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1507 (PERR: Slave signaled parity error)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1509 (SERR / PERR Detected on PCI bus)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1510 (SERR: Signaled Target Abort)	1. **Check Operating System event log.** 2. Run adapter card diagnostics, if available. 3. Adapter. 4. PCI switch card assembly. 5. I/O board.
1511 (MCA: Recoverable Error Detected)	• **Information only; run system diagnostic programs when multiple entries accumulate.**
1512 (MCA: Unrecoverable Error Detected)	1. **Run system diagnostic programs.** 2. Microprocessor x (where x = indicated microprocessor). 3. VRM. 4. Microprocessor tray assembly.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
SMI message code	**Suggested action**
1513 (MCA: Excessive Recoverable Errors)	1. **Run system diagnostic programs.** 2. Microprocessor x (where x = indicated microprocessor). 3. VRM. 4. Microprocessor tray assembly.
1514 (Rebuilding PCI BUS Map)	• **Information only.**
1515 (Excessive single-bit Errors Detected)	**Run memory diagnostic programs; then, replace indicated memory DIMM.**
1516 (WARNING: Memory Socket ECC Failure)	**Run memory diagnostic programs; then, replace indicated memory DIMM.**
151802 (Error configuring DIMMS, mismatch detected)	1. **Remove any recently added memory DIMMs.** 2. Reseat DIMMs. 3. Replace DIMMs one at a time to isolate failure.
151803 (Memory ProteXion Event Detected)	**Information only; run memory/system diagnostic programs when multiple entries accumulate.**
151805 (Error Reading Port Door Status)	1. **Run memory door diagnostic programs.** 2. Memory cassette, if indicated.
151806 (Memory door opened/closed while memory copy in progress)	• **Information only.**

Service processor messages

Following is an example of a typical service processor message.

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Date/Time: 2002/05/07 15:52:03
DMI Type:
Source: SERVPROC
Error Code: System Complex Powered Up
Error Code:
Error Data:
Error Data:
-   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

This message indicates that the server was turned on at the recorded time. The possible service processor error messages are listed in the following table.

Note: Try reseating a suspected component or reconnecting a cable before replacing the component.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Service Processor message	FRU/action
1.8V Fault	1. **If VRM indicator on light path is on, replace failing VRM 3 or 4.** 2. Microprocessor tray assembly. 3. Power supply. 4. Power backplane.
12V A Bus Fault	1. **Microprocessor tray assembly** 2. Power backplane
12V B Bus Fault	1. **VRM 3 o4r 4** 2. Microprocessor tray assembly 3. Power backplane
12V C Bus Fault	• **Microprocessor tray assembly**
12V D Bus Fault	1. **Hard disk drive** 2. SCSI cable 3. SCSI backplane
12V E Bus Fault	1. **Reseat adapters.** 2. I/O board assembly.
12V F Bus Fault	1. **SCSI backplane** 2. I/O board assembly
12V G Bus Fault	1. **Fan** 2. Power backplane
12V Planar Fault	• Power backplane
2.5V Fault	1. **Memory cassette** 2. Microprocessor tray assembly 3. Power backplane

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**
5V Planar Fault	• **I/O board assembly**
Application Posted Alert to ASM	• **Information only**
Cable: Media cable not detected	1. **Verify IDE media cable is properly connected.** 2. Media interposer card.
Cable: SCSI I2C cable not detected	1. **Verify SCSI cables are properly connected.** 2. SCSI backplane.
Continuous 3.3V over recommended value	• **I/O board assembly**
Continuous 3.3V under recommended value	• **I/O board assembly**
CPU X Over Temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range. 3. Verify microprocessor heat sinks are properly seated.
DASD X over recommended temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range.
Environmental Monitor firmware needs updating. No environmental information currently available.	• **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility.**
Environmental Monitor Flash Update Failed	• **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility.**
Environmental Monitor not responding	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility.** 2. Replace appropriate board.
Environmental Monitor RAM Error	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility** 2. Replace appropriate board.
Environmental Monitor ROM Error	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility** 2. Replace appropriate board.
Ethernet Data Rate modified from <value1> to <value2> by user <USERID>	• **Information only**
Ethernet Duplex setting modified from <value1> to <value1> by user <USERID>	• **Information only**
Ethernet interface <value> by user <USERID>	• **Information only**
Ethernet locally administered MAC address modified from x:x:x:x:x:x	• **Information only**
Ethernet MTU setting modified from x to y by user <USERID>	• **Information only**
Failure reading I2C device. Check devices on bus X	• **Run diagnostics.**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**

Fan X Failure (X of 1-6 = individual fans 1 through 6; X of 7=power supply 1; X of 8=power supply 2.)	1. **Verify no obstacles are blocking or inserted into the fan or power supply.**
	2. Check the physical connection and verify fan or power supply is properly seated.
	3. Replace component X:
	   a. Where X = a number from 1 through 6, replace fan X.
	   b. Where X = 7 or 8, replace power supply X.

Fan X not detected (X of 1-6 = individual fans 1 through 6; X of 7=power supply 1; X of 8=power supply 2.)	1. **Verify no obstacles are blocking or inserted into the fan or power supply.**
	2. Check the physical connection and verify fan or power supply is properly seated.
	3. Replace component X:
	   a. Where X = a number from 1 through 6, replace fan X.
	   b. Where X = 7 or 8, replace power supply X.

Fan X Outside Recommended Speed (X of 1-6 = individual fans 1 through 6; X of 7=power supply 1; X of 8=power supply 2.)	1. **Verify no obstacles are blocking or inserted into the fan or power supply.**
	2. Check the physical connection and verify fan or power supply is properly seated.
	3. Replace component X:
	   a. Where X = a number from 1 through 6, replace fan X.
	   b. Where X = 7 or 8, replace power supply X.

Front Panel is not plugged in	1. **Verify operator panel cables are properly connected (verify LED activity).** 2. Replace operator information panel.
Hard Drive X Fault	1. **Run diagnostics.** 2. Hard disk drive. 3. ServeRAID adapter. 4. SCSI backplane.
Hard drive X removal detected	• **Re-insert hard disk drive X and restart server.**
Hostname set to <value> by user <USERID>	• **Information only**
Hot plug card is not plugged in	1. **Verify PCI cabling.** 2. Failing hot plug cable/card.
Integrated Systems Management Processor encountered failures upon starting	1. **Remove ac power from the server and restart the server** 2. Run diagnostics.
Internal Error CPU X Fault	• **Microprocessor X**
Internal SCSI cable is not plugged in	1. **Verify SCSI cables are properly connected.** 2. SCSI backplane.
Invalid CPU configuration	• **Verify that microprocessors have been installed in the correct order (see "Installing a microprocessor" on page 44).**
Invalid Fan configuration	• **Replace any missing or failed fans.**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**
IP address of default gateway modified from x.x.x.x	• **Information only**
IP address of network interface modified from x.x.x.x	• **Information only**
IP subnet mask of network interface modified from x.x.x.x	• **Information only**
Loader Watchdog Triggered	1. **Reconfigure Loader Watchdog timer to be a higher value (twice the normal OS boot time).** 2. Install the Remote Supervisor Adapter II device driver for the appropriate operating system. 3. Disable the Loader Watchdog. 4. Check integrity of the installed operating system. 5. Re-install the operating system with appropriate device drivers.
Memory Port X Power Fault	1. **Verify that microprocessor tray assembly is fully engaged with memory cassette.** 2. Microprocessor tray assembly.
Multiple fan failures	• **Replace any missing or failed fans or power supplies.**
OS Watchdog Triggered	1. **Reconfigure O/S Watchdog timer to be a higher value.** 2. Re-Install the Remote Supervisor Adapter II device driver for the appropriate operating system. 3. Disable the O/S Watchdog. 4. Check integrity of the installed operating system. 5. Re-install the operating system with appropriate device drivers.
PFA Alert	• **See preceding entry in error log.**
POST Watchdog Triggered	1. **Reconfigure POST Watchdog timer to be a higher value (consistent with time it takes to complete POST).** 2. Disable the POST Watchdog.
Power Supply X 12V Over Current Fault	1. **Power supply** 2. Power backplane
Power Supply X 12V Over Voltage Fault	1. **Power supply** 2. Power backplane
Power Supply X 12V Under Voltage Fault	1. **Power supply** 2. Power backplane
Power Supply X AC Power Removed	1. **Insert the ac cord into power supply X.** 2. Replace power supply X.
Power Supply X Current Fault	1. **Power supply** 2. Power backplane

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**

Power Supply X DC Good Fault	1. **If system power present indicator is on, reduce to minimum configuration (see page 136) and replace components one at a time to isolate fault.**
	2. If no system power:
	  a. Power supply
	  b. Power backplane

Power Supply X Fan Fault	• **Power supply**
Power Supply X Removed	1. **Reinsert the referenced power supply** 2. Replace power supply X. 3. Replace power backplane.
Power Supply X Temperature Fault	1. **Verify fan air intake areas are clear and well-ventilated.** 2. Verify all system fans are installed and functioning. 3. Power supply x.
Power supply current exceeded max spec value	1. **Insert another power supply (if possible) and ensure AC cord connections** 2. Remove devices consuming extraordinary power from the system. 3. Replace power backplane.
Processor configuration prohibits CPU X from operating at maximum speed	• **Information only**
Remote Login Successful. Login ID:	• **Information only**

Resetting system due to an unrecoverable error	• **Check light path LEDs for faults:**
	  1. Microprocessors
	  2. DIMMs
	  3. Memory board
	  4. Microprocessor tray assembly
	  5. I/O board assembly

Single fan failure	• **Replace any missing or failed fans or power supplies.**
System Approaching Maximum Power Consumption	1. **Insert another power supply (if possible) and verify ac cord connections.** 2. Remove devices consuming extraordinary power from the system. 3. Replace power backplane.
System Boot Failed	1. **Check the POST/BIOS boot checkpoint indicator and refer to appropriate documentation.** 2. Verify memory board and DIMMs are properly connected and seated, and that they are functional. 3. Attempt to boot from backup BIOS image.
System Complex Powered Down	• **Information only**
System Complex Powered Up	• **Information only**
System error log full	• **Clear Event Log.**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**
System is over recommended voltage for 1.8V CPU	1. **Check light path and replace failing component.** 2. VRM 3 or 4. 3. Microprocessor x.
System is over recommended voltage on VRM X	1. **VRM 3 or 4** 2. Microprocessor tray assembly
System is under recommended voltage for 1.8V CPU	1. **Check light path and replace failing component.** 2. VRM 3 or 4. 3. Microprocessor x.
System is under recommended voltage on VRM X	1. **VRM 3 or 4** 2. Microprocessor tray assembly
System log 75%% full	• **Information only**
System Memory Error	1. **Reseat memory card and DIMMs.** 2. Replace memory.
System over recommended ambient temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range.
System over recommended voltage for +12v	1. **Power supply** 2. Power backplane
System over recommended voltage for +5v	1. **Power supply** 2. Power backplane 3. I/O board assembly
System over recommended voltage on +2.5v	• **Microprocessor tray assembly**
System over recommended voltage on +3.3v	• **I/O board assembly**
System over temperature for CPU X	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range. 3. Verify the microprocessor heat sinks are properly seated.
System Power Good Fault	• **Reseat/replace VRMs 3 and 4.**
System Running Nonredundant Power	1. **Insert another power supply (if possible) and verify ac cord connections.** 2. Remove devices consuming extraordinary power from the system. 3. Replace power backplane.
System shutoff due to +1.5v over voltage	1. **Check light path and replace failing component.** 2. VRM 3 or 4. 3. Microprocessor x. 4. Microprocessor tray assembly.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor message	**FRU/action**
System shutoff due to +1.5v under voltage	1. **Check light path and replace failing component.** 2. VRM 3 or 4. 3. Microprocessor x. 4. Microprocessor tray assembly.
System shutoff due to +12v over voltage	1. **Power supply** 2. Power backplane
System shutoff due to +12v under voltage	1. **Power supply** 2. Power backplane
System shutoff due to +2.5v over voltage	1. **Check light path and replace failing component.** 2. Microprocessor tray assembly.
System shutoff due to +2.5v under voltage	1. **Check light path and replace failing component.** 2. Microprocessor tray assembly.
System shutoff due to +3.3v over voltage	• **I/O board assembly**
System shutoff due to +3.3v under voltage	• **I/O board assembly**
System shutoff due to +5v over voltage	1. **Power supply** 2. I/O board assembly
System shutoff due to +5v under voltage	1. **Power supply** 2. I/O board assembly
System shutoff due to CPU X over temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range. 3. Verify the microprocessor heat sinks are properly seated.
System shutoff due to DASD X temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range.
System shutoff due to high ambient temperature	1. **Check all fans and remove any obstacles from the path of airflow.** 2. Verify room temperature is within recommended range.
Systems Management RTC battery is no longer reliable	• **Replace Remote Supervisor Adapter II.**
User <USERID> attempting to power/reset server	• **Information only**
VRM X Power Good Fault	1. **VRM 3 or 4** 2. Microprocessor tray assembly

The service processor also generates a large number of information, error, and warning messages.

If an RXE-100 unit is attached, the service processor might generate further messages specific to this unit, which are listed in the following table:

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor/RXE-100 message	**FRU/action**
PCI Expansion Unit X Side A or B: +1.8v over voltage	• **Replace board as indicated.**
PCI Expansion Unit X Side A or B: +1.8V Power Not Adequate	• **Replace board as indicated.**
PCI Expansion Unit X Side A or B: +1.8v under recommended voltage	1. **Check for shorts on boards.** 2. Replace board as indicated.
PCI Expansion Unit X Side A or B: +1.8v under voltage	1. **Check for shorts on boards.** 2. Replace board as indicated.
PCI Expansion Unit X Side A or B: +12V A Bus Fault	1. **Check all slots.** 2. Replace Board A 3. Replace DMC card. 4. Power backplane. 5. Power supply.
PCI Expansion Unit X Side A or B: +12V B Bus Fault	1. **Check all slots.** 2. Replace Board B. 3. Replace DMC card. 4. Power backplane 5. Power supply
PCI Expansion Unit X Side A or B: +12V C Bus Fault	1. **Replace fans one at a time until error clears.** 2. Replace DMC card. 3. Power backplane 4. Power supply
PCI Expansion Unit X Side A or B: +12V D Bus Fault	1. **DMC card.** 2. Power backplane 3. Power supply
PCI Expansion Unit X Side A or B: +12v over recommended voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: +12v over voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: +12v under recommended voltage	1. **Check adapters for shorts.** 2. Check pins. 3. Power supply
PCI Expansion Unit X Side A or B: +12v under voltage	1. **Check adapters for shorts.** 2. Check pins. 3. Power supply.
PCI Expansion Unit X Side A or B: +2.5V Branch-A Power Not Adequate	• **Remove adapters one at a time.**
PCI Expansion Unit X Side A or B: +2.5V Branch-B Power Not Adequate	• **Remove adapters one at a time.**
PCI Expansion Unit X Side A or B: +2.5v over recommended voltage	• **Replace Board A or B as indicated.**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor/RXE-100 message	**FRU/action**
PCI Expansion Unit X Side A or B: +2.5v over voltage	• **Replace Board A or B as indicated.**
PCI Expansion Unit X Side A or B: +2.5v under recommended voltage	1. **Check for obvious shorts.** 2. Replace board A or B as indicated.
PCI Expansion Unit X Side A or B: +2.5v under voltage	• **Replace Board A or B as indicated.**
PCI Expansion Unit X Side A or B: +3.3v over recommended voltage	1. **Check ac power.** 2. Replace VRM40. 3. Replace dc power supply.
PCI Expansion Unit X Side A or B: +3.3v over voltage	1. **Verify ac power is working correctly.** 2. VRM-40. 3. Power supply.
PCI Expansion Unit X Side A or B: +3.3v PCI over recommended voltage	• **Replace adapter card as indicated.**
PCI Expansion Unit X Side A or B: +3.3v PCI over voltage	• **Replace Board.**
PCI Expansion Unit X Side A or B: +3.3v PCI under recommended voltage	1. **Check ac power.** 2. Check for shorted adapter in slots 5 or 6. 3. Replace VRM40. 4. Replace dc power supply. 5. Replace board.
PCI Expansion Unit X Side A or B: +3.3v PCI under voltage	• **Replace Board as indicated.**
PCI Expansion Unit X Side A or B: +3.3V Power Not Adequate	• **Remove adapters one at a time.**
PCI Expansion Unit X Side A or B: +3.3v under recommended voltage	1. **Check ac power.** 2. Check for shorted adapter in slots 1,2,3, or 4. 3. Replace VRM40. 4. Replace dc power supply. 5. Replace board.
PCI Expansion Unit X Side A or B: +3.3v under voltage	1. **Check ac power.** 2. Check for shorted adapter in slots 1,2,3, or 4. 3. Replace VRM40. 4. Replace dc power supply. 5. Replace board.
PCI Expansion Unit X Side A or B: +3.3V VRM Power Not Adequate	• **Remove adapters one at a time.**
PCI Expansion Unit X Side A or B: +5V Fault	1. **Check slot 1, 2, 3, or 4 for short.** 2. Power supply.
PCI Expansion Unit X Side A or B: +5v over recommended voltage	• **Replace power supplies one at a time until error clears.**
PCI Expansion Unit X Side A or B: +5v over voltage	• **Replace power supplies one at a time until error clears.**

Service Processor/RXE-100 message	FRU/action
Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
PCI Expansion Unit X Side A or B: +5V Power Not Adequate	• **Remove adapters one at a time.**
PCI Expansion Unit X Side A or B: +5v under recommended voltage	1. **Check slot 5 or 6 for short or bent pins.** 2. Power supply
PCI Expansion Unit X Side A or B: +5v under voltage	1. **Check slot 5 or 6 for short. Check pins between PCI and DMC card.** 2. Power supply
PCI Expansion Unit X Side A or B: -12v over recommended voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: -12v over voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: -12v under recommended voltage	1. **Check pins between PCI and DMC card and all slots.** 2. Power supply
PCI Expansion Unit X Side A or B: -12v under voltage	1. **Check pins between PCI and DMC card and all slots.** 2. Power supply
PCI Expansion Unit X Side A or B: Chipset Power-Good Fault	• **I/O board.**
PCI Expansion Unit X Side A or B: Continuous +3.3v over voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: Continuous +3.3v under voltage	1. **Check pins between PCI and DMC card.** 2. Power supply
PCI Expansion Unit X Side A or B: Continuous +5v over voltage	• **Power supply.**
PCI Expansion Unit X Side A or B: Continuous +5v under voltage	1. **Check pins between PCI and DMC card.** 2. Power supply
PCI Expansion Unit X Side A or B: Environmental Monitor Flash Update Failed	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility.** 2. Replace appropriate board.
PCI Expansion Unit X Side A or B: Environmental Monitor RAM Error	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility.** 2. Replace appropriate board.
PCI Expansion Unit X Side A or B: Environmental Monitor ROM Error.	1. **Run the latest version of the Remote Supervisor Adapter Firmware Update Utility** 2. Replace appropriate board.
PCI Expansion Unit X Side A or B: Expansion system over recommended ambient temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: Failure reading an I2C device	1. **Replace power backplane.** 2. Replace power supply. 3. Replace DMC card. 4. Board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor/RXE-100 message	**FRU/action**
PCI Expansion Unit X Side A or B: Fan X Failure	1. **Verify no obstacles are blocking or inserted into the fan in RXE-100.** 2. Check the physical connection and ensure fan is properly seated in RXE-100. 3. Replace fan in RXE-100.
PCI Expansion Unit X Side A or B: Fan X not detected	1. **Verify no obstacles are blocking or inserted into the fan in RXE-100.** 2. Check the physical connection and ensure fan is properly seated in RXE-100. 3. Replace fan in RXE-100.
PCI Expansion Unit X Side A or B: Fan X Outside Recommended Speed	1. **Verify no obstacles are blocking or inserted into the fan in RXE-100.** 2. Check the physical connection and ensure fan is properly seated in RXE-100. 3. Replace fan in RXE-100.
PCI Expansion Unit X Side A or B: Front Control Panel Not Present	1. **Verify operator information panel cables are properly connected (verify LED activity).** 2. Operator information panel.
PCI Expansion Unit X Side A or B: High ambient temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100.** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: Hot Plug Switch cable not detected	• **Reseat/replace cable.**
PCI Expansion Unit X Side A or B: Invalid Fan configuration	• **Replace any missing or failed fans.**
PCI Expansion Unit X Side A or B: Invalid PCI Planar/RS485 Interconnect configuration	• **Verify RXE-100 cabling has been installed correctly.**
PCI Expansion Unit X Side A or B: Invalid RS485 Interconnect Configuration	• **Verify RXE-100 cabling has been installed correctly.**
PCI Expansion Unit X Side A or B: ISM controller over recommended temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100.** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: ISM controller over temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100.** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: ISM Processor encountered failures upon starting	1. **Remove ac power from the system and the RXE-100.** 2. Restart system. 3. Run diagnostics.
PCI Expansion Unit X Side A or B: PCI +5v over voltage	• **Replace Boards one at a time until error clears.**
PCI Expansion Unit X Side A or B: PCI +5v under voltage	1. **Check slots 1,2,3, and 4 for shorts.** 2. Check pins between PCI and DMC card. 3. Power supply.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor/RXE-100 message	**FRU/action**
PCI Expansion Unit X Side A or B: PCI planar area over recommended temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100.** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: PCI planar area over temperature	1. **Check all fans and remove any obstacles from the path of airflow in RXE-100.** 2. Verify room temperature is within recommended range.
PCI Expansion Unit X Side A or B: Power Controller not present	1. **Reseat power backplane.** 2. Power backplane. 3. DMC card.
PCI Expansion Unit X Side A or B: Power Supply X +12V Over Current Fault.	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X +12V Over Voltage	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X +12V Under Voltage	1. **Check adapters for shorts.** 2. Verify pins on adapters are not damaged. 3. Power supply.
PCI Expansion Unit X Side A or B: Power Supply X +5V Over Current Fault	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X +5V Over Voltage	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X +5V Under Voltage	1. **Check adapters for shorts.** 2. Verify pins on adapters are not damaged. 3. Power supply.
PCI Expansion Unit X Side A or B: Power Supply X -12V Over Current Fault	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X -12V Over Voltage	• Power supply
PCI Expansion Unit X Side A or B: Power Supply X -12V Under Voltage	1. **Check adapters for shorts.** 2. Verify pins on adapters are not damaged. 3. Power supply.
PCI Expansion Unit X Side A or B: Power Supply X AC Power Removed	1. **Insert the ac cord into the referenced power supply in the RXE-100** 2. Replace power supply X.
PCI Expansion Unit X Side A or B: Power Supply X Aux +5V Over Voltage	• **Replace power supplies, one at a time.**
PCI Expansion Unit X Side A or B: Power Supply X Fan Failure	• **Reseat/replace power supply.**
PCI Expansion Unit X Side A or B: Power Supply X Fault	1. **Verify ac power is functioning correct.y.** 2. Power supply.
PCI Expansion Unit X Side A or B: Power Supply X Over Temperature	1. **Verify proper operation of the fan inside the power RXE-100 power supply** 2. Replace power supply X.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Service Processor/RXE-100 message	**FRU/action**
PCI Expansion Unit X Side A or B: Power Supply X Power-Good Fault	1. **Verify ac power is functioning correct.y.** 2. Power supply.
PCI Expansion Unit X Side A or B: Power Supply X Removed	1. **Reinsert the referenced power supply in the RXE-100** 2. Replace power supply X. 3. Replace power backplane.
PCI Expansion Unit X Side A or B: Power supply current exceeded max spec value	1. **Insert another power supply (if possible) and verify ac cord connections to the RXE-100** 2. Remove devices consuming extraordinary power from the RXE-100. 3. Replace RXE-100 power backplane.
PCI Expansion Unit X Side A or B: Power to PCI Controller Not Adequate	• **Remove adapters, one at a time.**
PCI Expansion Unit X Side A or B: Resetting system due to an unrecoverable error	• **Refer to server diagnostics to check configuration.**
PCI Expansion Unit X Side A or B: System Approaching Maximum Power Consumption	1. **Insert another power supply (if possible) and verify ac cord connections to the RXE-100.** 2. Remove devices consuming extraordinary power from the RXE-100. 3. Replace RXE-100 power backplane.
PCI Expansion Unit X Side A or B: System Power Not Adequate	• **Remove adapters, one at a time.**
PCI Expansion Unit X Side A or B: System Running Nonredundant Power	1. **Insert another power supply (if possible) and verify ac cord connections to the RXE-100.** 2. Remove devices consuming extraordinary power from the RXE-100. 3. Replace RXE-100 power backplane.

Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to "Starting the diagnostic programs" on page 23 to test the computer.

If you have just added new software or a new option and the computer is not working, use the following procedures before using the error symptom charts:

1. Check the operator information panel for the light path LEDs (see "Light path diagnostics" on page 18).
2. Remove the software or device that you just added.
3. Run the diagnostic tests to determine whether the computer is running correctly.
4. Reinstall the new software or new device.

In the following table, if the entry in the FRU/action column is a suggested action, perform that action; if it is the name of a component, reseat the component and replace it if necessary. The most likely cause of the symptom is listed first.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

CD-ROM drive problems	
Symptom	**FRU/action**

CD-ROM drive is not recognized.	1. **Verify that:**
	   • The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program. If the server has a single IDE channel, only the primary channel can be used.
	   • All cables and jumpers are installed correctly.
	   • The correct device driver is installed for the CD-ROM drive.
	2. Run CD-ROM drive diagnostic programs.
	3. CD-ROM drive.
	4. Cable.
	5. Media interposer card.
	6. I/O board.

CD is not working properly.	1. **Clean the CD.** 2. Run CD-ROM drive diagnostic programs. 3. CD-ROM drive.
CD-ROM drive tray is not working. (The computer must be turned on.)	1. **Insert the end of a straightened paper clip into the manual tray-release opening.** 2. Run CD-ROM drive diagnostic programs. 3. CD-ROM drive.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Diskette drive problems	
Symptom	**FRU/action**

Diskette drive activity LED stays lit, or the server bypasses the diskette drive.	1. **If there is a diskette in the drive, verify that:**
	   • The diskette drive is enabled in the Configuration/Setup utility program.
	   • The diskette is good and not damaged. (Try another diskette if you have one.)
	   • The diskette is inserted correctly in the drive.
	   • The diskette contains the necessary files to start the server.
	   • The software program is working properly.
	   • The cable is installed correctly (in the proper orientation).
	2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).
	3. Run diskette drive diagnostic programs.
	4. Cable.
	5. Diskette drive.
	6. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Expansion enclosure problems	
Symptom	**FRU/action**

The SCSI expansion enclosure used to work but does not work now.	1. **Verify that:**
	  • The cables for all external SCSI options are connected correctly.
	  • The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.
	  • Any external SCSI devices are turned on. You must turn on an external SCSI option before turning on the server.
	2. For more information, see your SCSI expansion enclosure documentation.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Hard disk drive problems	
Symptom	**FRU/action**
Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).	1. **Remove the first drive not recognized and try the hard disk drive diagnostic test again.** 2. If the remaining drives are recognized, replace the drive you removed with a new one.
Server stops responding during hard disk drive diagnostic test.	1. **Remove the hard disk drive being tested when the server stopped responding and try the diagnostic test again.** 2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.
Hard drive not detected while loading operating system.	1. **Verify SCSI backplane is enabled in Configuration/Setup Utility program.** 2. Verify LSI driver is loaded.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

General problems	
Symptom	**FRU/action**
Broken cover locks or indicator LEDs not working	• **Broken CRU/FRU**

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Intermittent problems	
Symptom	**FRU/action**

A problem occurs only occasionally and is difficult to diagnose.	1. **Verify that:**
	  • All cables and cords are connected securely to the rear of the server and attached devices.
	  • When the server is turned on, air is flowing from the rear of the server at the fan grill. If there is no airflow, the fan is not working. This can cause the server to overheat and shut down.
	  • The SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.
	2. Check the system error log.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Keyboard, mouse, or pointing-device problems (non-USB)	
Symptom	**FRU/action**

All or some keys on the keyboard do not work.	1. **Verify that:**
	  • The keyboard cable is securely connected to the server, and that the keyboard and mouse cables are not reversed.
	  • Both the server and the monitor are turned on.
	2. Keyboard.
	3. I/O board.

The mouse or pointing device does not work.	1. **Verify that:**
	  • The mouse or pointing-device cable is securely connected, and that the keyboard and mouse cables are not reversed.
	  • The mouse device drivers are installed correctly.
	  • Both the server and the monitor are turned on.
	2. Mouse or pointing device.
	3. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
USB keyboard, mouse, or pointing-device problems	
Symptom	**FRU/action**
All or some keys on the keyboard do not work.	1. **Verify that the keyboard cable is securely connected to the server, and the keyboard and mouse cables are not reversed.** 2. Verify that the server and the monitor are turned on. 3. Keyboard. 4. I/O board. **Note:** After installing a USB keyboard, you might need to use the Configuration/Setup Utility to enable keyboardless operation to prevent POST error message 301 from being displayed during startup.
The USB mouse or USB pointing device does not work.	1. **Verify that the mouse or pointing-device USB cable is securely connected to the server, that the keyboard and mouse or pointing-device cables are not reversed, and that the device drivers are installed correctly.** 2. Make sure that the system and the monitor are turned on. 3. Make sure that the USB mouse support is enabled in BIOS. 4. If a USB hub is in use, disconnect the USB device from the hub and connect it directly to the server. 5. Mouse or pointing device. 6. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Memory problems	
Symptom	**FRU/action**

The amount of system memory displayed is less than the amount of physical memory installed.	1. **Verify that:**
	  • No error LEDs are lit on the operator information panel or in the memory cassette.
	  • Memory mirroring does not account for the mismatch.
	  • The memory modules are seated properly.
	  • You have installed the correct type of memory.
	  • If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.
	  • All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
	2. Check POST error log for error message 289:
	  • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.
	  • If the DIMM was disabled by the user or by POST:
	    a. Start the Configuration/Setup Utility program.
	    b. Enable the DIMM.
	    c. Save the configuration and restart the computer.
	3. DIMM.
	4. Memory cassette[

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Microprocessor problems	
Symptom	**FRU/action**
The server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	1. **Verify that the startup microprocessor is seated correctly.** 2. Startup microprocessor. 3. Microprocessor VRM 3 or 4. 4. Microprocessor tray assembly.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Monitor problems	
Symptom	**FRU/action**
Testing the monitor.	**See the information that comes with the monitor** for adjusting and testing instructions. (Some IBM monitors have their own self-tests.) 1. **Monitor.** 2. Run diagnostic programs. If diagnostic programs pass, the problem may be a video driver. 3. Remote Supervisor Adapter II. 4. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Monitor problems	
Symptom	**FRU/action**

The screen is blank.	1. **Verify that:**
	  • The server power cord is plugged into the server, and into a working electrical outlet or power distribution unit.
	  • The monitor cables are connected correctly.
	  • The monitor is turned on and the brightness and contrast controls are adjusted correctly.
	
	  Important: In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the **Start Options** of the Configuration/Setup Utility program is set to enabled (its default setting), you must restart the server three times to force the system BIOS code to reset the configuration settings to the default configuration (memory connector or bank of connectors enabled).
	2. If you have verified these items and the screen remains blank, replace:
	  a. Monitor
	  b. Remote Supervisor Adapter II.
	  c. I/O board

Only the cursor appears.	• **See "Undetermined problems" on page 136.**

The monitor works when you turn on the server but goes blank when you start some application programs.	1. **Verify that:**
	  • The application program is not setting a display mode higher than the capability of the monitor.
	  • The primary monitor cable is connected to the optional Remote Supervisor Adapter II or C2T breakout cable.
	  • You installed the necessary device drivers for the applications.
	2. Monitor.
	3. Remote Supervisor Adapter II.
	4. I/O board.

The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	1. **If the monitor self-tests show the monitor is working properly, consider the location of the monitor.** Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.
	  Attention: Moving a color monitor while it is turned on might cause screen discoloration.
	  Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.
	  Notes:
	  a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).
	  b. Non-IBM monitor cables might cause unpredictable problems.
	  c. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, contact your IBM reseller or IBM marketing representative.
	2. Monitor.
	3. Remote Supervisor Adapter II.
	4. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Monitor problems	
Symptom	**FRU/action**
Wrong characters appear on the screen.	1. **If the wrong language is displayed, update the BIOS code with the correct language.** 2. Monitor. 3. Remote Supervisor Adapter II. 4. I/O board.
No video.	1. **Verify that the correct machine is selected, if applicable.** 2. Make sure all cables are locked down.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Option problems	
Symptom	**FRU/action**

An IBM option that was just installed does not work.	1. **Verify that:**
	  • The option is designed for the server (see the ServerProven list on the World Wide Web at http://www.ibm.com/pc/compat/).
	  • You followed the installation instructions that came with the option.
	  • The option is installed correctly.
	  • You have not loosened any other installed options or cables.
	  • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.
	2. Option you just installed.

An IBM option that used to work does not work now.	1. **Verify that all of the option hardware and cable connections are secure.**
	2. If the option comes with test instructions, use those instructions to test the option.
	3. If the failing option is a SCSI device, verify that:
	  • The cables for all external SCSI devices are connected correctly.
	  • The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.
	  • Any external SCSI device is turned on. You must turn on an external SCSI device before turning on the computer.
	4. Failing option.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Power problems	
Symptom	**FRU/action**
Power switch does not work and reset button, if supported, does work.	1. **Reseat memory cassette.** 2. Reseat power switch connector. 3. Power backplane. 4. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Power problems	
Symptom	**FRU/action**

The server does not turn on.	**Note:** The xSeries 365 server requires two 950W hot swap power supplies for full redundancy at both 220V and 110V.
	
	1. **Verify that:**
	   • The power cables are properly connected to the computer.
	   • The electrical outlet functions properly.
	   • The type of memory installed is correct.
	   • The memory cassette is fully seated.
	   • If you just installed an option, remove it, and restart the server. If the server now turns on, you might have installed more options than the power supply supports.
	   • The LEDs on the power supply are do not reflect a problem.
	   • Verify that microprocessors are installed in the correct sequence.
	
	2. Override front panel power button:
	   a. Disconnect server power cords.
	   b. Reconnect power cords.
	   c. Reseat the operator information panel cables, then repeat steps 2a and 2b.
	   If server turns on:
	   • Operator information panel
	   If server does not turn on, see "Power LED errors" on page 130.
	
	3. See "Undetermined problems" on page 136..

The server does not turn off.	1. **Verify whether you are using an ACPI or non-ACPI operating system.** If you are using a non-ACPI operating system:
	   a. Press Ctrl+Alt+Delete.
	   b. Turn off the system by holding the power-control button for 5 seconds.
	   c. If computer fails during BIOS POST and power-control button does not work, remove the ac power cord.
	
	2. If the problem remains or if you are using an ACPI-aware operating system, suspect the I/O board.

The server unexpectedly shuts down and the LEDs on the front panel are not lit.	• See 12V bus fault messages at "Service processor messages" on page 109.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Serial port problems	
Symptom	**FRU/action**

The number of serial ports identified by the operating system is less than the number of serial ports installed.	1. **Verify that:**
	   • Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports is disabled.
	   • The serial-port adapter, if you installed one, is seated properly.
	
	2. Failing serial port adapter.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Serial port problems	
Symptom	**FRU/action**

A serial device does not work.	1. **Verify that:**
	   • The device is compatible with the server.
	   • The serial port is enabled and is assigned a unique address.
	   • The device is connected to the correct port (see "I/O connectors" on page 61).
	2. Failing serial device.
	3. Serial cable.
	4. Remote Supervisor Adapter II cabling.
	5. I/O board.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Software problem	
Symptom	**FRU/action**

Suspected software problem.	1. **To determine whether the problem is caused by the software, verify that:**
	   • The server has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software.
	    Note: If you have just installed an adapter or memory, the server might have a memory address conflict.
	   • The software is designed to operate on the server.
	   • Other software works on the server.
	   • The software that you are using works on another server.
	If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
	2. If you have verified these items and the problem remains, contact your place of purchase.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
Universal Serial Bus (USB) port problems	
Symptom	**FRU/action**

A USB device does not work.	• **Verify that:**
	   – You are not trying to use a USB device during POST if you have a standard (non-USB) keyboard attached to the keyboard port.
	    Note: If a standard (non-USB) keyboard is attached to the keyboard port, the USB is disabled and no USB device will work during POST.
	   – The correct USB device driver is installed.
	   – The operating system supports USB devices.
	   – If a USB hub is in use, disconnect the USB device from the hub and connect it directly to the server.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.	
ServerGuide problems	
Symptom	**FRU/action**
Setup and Installation CD will not start.	• **Make sure that the server supports the ServerGuide program and has a startable (bootable) CD-ROM (or DVD-ROM) drive.** • If the startup (boot) sequence settings have been altered, make sure that the CD-ROM drive is first in the startup sequence. • If more than one CD-ROM drive is installed, make sure that only one drive is set as the primary drive. Start the CD from the primary drive.
SCSI RAID program cannot view all installed drives the operating system cannot be installed.	• **Make sure that there are no duplicate SCSI IDs or IRQ assignments.** • Make sure that the hard disk drive is connected properly.
The operating-system Installation program continuously loops.	• **Make more space available on the hard disk.**
ServerGuide will not start the operating-system CD.	• **Make sure that the NOS CD you have is supported by the ServerGuide program.** See the CD label for a list of supported NOS versions.
The operating system cannot be installed; the option is not available.	• **Make sure that the operating system is supported on the server.** If the operating system is supported, either there is no logical drive defined (SCSI RAID systems), or the ServerGuide System Partition is not present. Run the ServerGuide program, and make sure that setup is complete.

Power LED errors

Use the power-supply LED information in the following table to solve power-supply problems.

Notes:

1. The minimum configuration required for the power supply DC good LED to be lit is:
   • Power supply
   • Power backplane
   • Power cord
   • Memory cassette
   • Microprocessor tray assembly

2. The minimum configuration required for the system to come on is:
   • Power supply
   • Power backplane
   • Power cord
   • Memory cassette
   • Microprocessor tray assembly
   • I/O board
   • Operator information panel and cables

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician.

Power supply LEDs			Operator information panel LED	Description	FRU/action
AC good	DC good	Fan			
Off	Off	Off	Off	No power to system or ac problem.	1. **Check ac power to system.** 2. Make sure power cord is plugged in to a functioning power source. 3. Isolate by removing one power supply at a time.
On	Off	Off	Off	DC source power problem	1. **Make sure memory cassette is seated in microprocessor tray assembly and that microprocessor tray assembly is connected to power backplane.** 2. Isolate by removing one power supply at a time. 3. View service processor error logs through serial connection of remote supervisor adapter.
On	On	Off	Off	Standby power problem	1. **View service processor error logs through serial connection of remote supervisor adapter.** 2. If no 3.3vsby, replace power backplane. 3. If no 5vco, isolate by removing one power supply at a time.
On	On	Off	Blinking	System power-on problem	1. **View service processor error logs through serial connection of remote supervisor adapter.** 2. Press power button on operator information panel. 3. Use force power-on jumper as debug aid (see "Microprocessor board connectors, jumpers and LEDs" on page 68) to eliminate operator information panel switch and cable. 4. Remove service processor and attempt to turn on the server.
On	On	On	On	Power supply fan fault	• **Replace power supply.**
On	On	Off	On	Power is OK.	**N/A**

SCSI error messages

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer, and which components should be replaced by an IBM field service technician.	
Error message	**FRU/action**
All SCSI Errors One or more of the following devices might be causing the problem: • A failing SCSI device (adapter, drive, controller) • An improper SCSI configuration or SCSI termination jumper setting • Duplicate SCSI IDs in the same SCSI chain • A missing or improperly installed SCSI terminator • A defective SCSI terminator • An improperly installed cable • A defective cable	1. **External SCSI devices must be turned on before you turn on the server.** 2. The cables for all external SCSI devices are connected correctly. 3. If you have attached an external SCSI device to the server, verify that the external SCSI termination is set to automatic. 4. The last device in each SCSI chain is terminated correctly. 5. The SCSI devices are configured correctly.

ServeRAID (ISPR) error procedures

Use the ISPR error procedures to help you solve ServeRAID problems. A complete list of error codes is listed in "ServeRAID error codes" on page 134.

Note: Where the ISPR error procedures refer to a hard disk drive backplane, see the chapter of this publication that concerns service replaceable units.

EF10 (Default ISPR)
1. No ISPR error present.

9ZXX through BZXX (SCSI bus error caused by cables, termination, defective drives, or similar problem)
1. Isolate between SCSI subsystem and controller by disconnecting all hard disk drive cables from suspect card, and restart.

   Attention: Do not press F5. Doing so changes the server configuration.

   If an ISPR error is still present, perform the following actions until the error is no longer present:

   a. Reseat the controller
   b. Replace the controller

   Notes:
   a. SCSI channel cable details, if any, appear elsewhere in this publication.
   b. The adapter/controller detects a configuration change. *Do not* choose **Save Changes**. Instead, select F10 to bypass any options to this effect.
2. If ISPR error is **EF10** after disconnecting cables:
   a. Identify which channel is causing the error by the second digit (Z) of the original ISPR code as indicated in the following table.

      Note: ServeRAID-4H controllers have 4 channels; ServeRAID-4L and -4Lx controllers have only one channel; and ServeRAID-4M and -4Mx

controllers have 2 channels. ServeRAID-5i controllers have no channels. The ServeRAID-5i uses the channel connectors of the onboard integrated SCSI controller.

SCSI channel code (z)	Descriptions
1	Channel 1
2	Channel 2
3	Channel 1 and 2
4	Channel 3
5	Channel 1 and 3
6	Channel 2 and 3
7	Channel 1, 2, and 3
8	Channel 4
9	Channel 1 and 4
A	Channel 2 and 4
B	Channel 1, 2, and 4
C	Channel 3 and 4
D	Channel 1, 3, and 4
E	Channel 2, 3, and 4
F	Channel 1, 2, 3, and 4

b. Confirm that the channels identified from the error in step 2a on page 132 are the cause of the error by verifying that the error presents itself *only* when the offending channel is reconnected.

c. Check termination of identified channel.

   Note: SCSI channel termination details, if any, appear elsewhere in this publication.

d. Check for proper backplane jumper configuration.

   Note: SCSI channel jumper details, if any, appear elsewhere in this publication.

e. Check for proper cabling configuration in systems that use hard disk drive status cables. Reconnect all cables removed in step 1 on page 132.

f. Disconnect one drive at a time attached to the channel identified in step 2a on page 132; then, restart to determine which drive is causing the error.

g. Replace hard disk drive cable.

h. Replace hard disk drive backplane.

FFFF or other code not listed

1. Place download jumpers on the controller and try to flash the firmware code to the card.

2. Isolate between SCSI subsystem and controller by disconnecting all hard disk drive cables attached to the suspect card, and restart.

   Attention: Do not press F5. Doing so changes the server configuration.

   If ISPR code is **EF10** after disconnecting cables, follow these steps until the error is eliminated:

a. Identify which channel is causing the error by reconnecting cables one at a time and restarting until the error returns.

b. Check termination of identified channel in step 2a.

   Note: SCSI channel termination details, if any, appear elsewhere in this publication.

c. Disconnect one drive at a time attached to channel identified in step 2a and restart each time to determine which drive is causing the problem.

d. Replace hard disk drive cable attached to channel identified in step 2a.

e. Replace backplane attached to channel identified in step 2a.

3. If original ISPR code is still present after disconnecting all hard disk drive cables and restarting, perform the following actions until the error is no longer present:

   - Reseat the controller
   - Replace the controller

ServeRAID error codes

In the following error codes, x can be any number or letter.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer, and which components should be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
1xxx (Microcode checksum error)	• **ServeRAID controller**
2xxx (Code DRAM error)	1. **Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers.** 2. ServeRAID controller.
3000-31xx(Code DRAM error)	1. **Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers.** 2. ServeRAID controller.
3200 (Code DRAM error)	1. **Install download jumpers, flash latest level BIOS code and firmware for controller. Remove jumpers.** 2. ServeRAID controller.
3E2x	1. **Reseat the ServeRAID controller.** 2. Flash latest level of BIOS code and firmware for controller. 3. ServeRAID-5i controller. 4. Integrated RAID controller on server.
4xxx thru 5xxx (Code DRAM error)	1. **Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers.** 2. ServeRAID controller.
6xxx (Cache DRAM error) (ServeRAID-4H only)	1. **Reseat daughter card.** 2. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers. 3. ServeRAID controller.

Note: See Chapter 7, "Parts listing, Types 8861, 8862," on page 139 to determine which components are replaceable by the customer, and which components should be replaced by an IBM field service technician.	
Error code/symptom	**FRU/action**
7xxx thru 8xxx (Host/local PCI bus interface error)	1. **Flash latest level of BIOS code and firmware for controller.** 2. If ServeRAID-4x controller, replace controller. 3. If ServeRAID-5i controller, integrated RAID controller on the server.
9003	1. **Flash latest level of BIOS code and firmware for controller.** 2. Confirm that this controller is a supported option for this system. 3. ServeRAID controller. 4. Integrated RAID controller on the server).
9xxx thru BZxx (SCSI bus error caused by cables, termination, defective drives, etc.). Z refers to the specific channel or channels that cause the error.	1. **Follow indications at "ServeRAID (ISPR) error procedures" on page 132. Follow those instructions before continuing with the next steps listed in this index.** 2. Hard disk drive cable. 3. Hard disk drive backplane. 4. Hard disk drive. 5. ServeRAID controller.
EFFE (Firmware code corrupt or download jumpers are in place)	1. **Flash latest level BIOS and firmware for controller; then, remove jumpers.** 2. ServeRAID controller.
FFFF or other code not listed	1. **Follow indications at "ServeRAID (ISPR) error procedures" on page 132.** 2. Hard disk drive cable. 3. Hard disk drive backplane. 4. Hard disk drive. 5. ServeRAID controller.

Undetermined problems

Use the information in this section if the diagnostic tests did not diagnose the failure or if the server is inoperative.

Notes:
1. If you suspect a software mismatch is causing failures (solid or intermittent), be sure to see "Error symptoms" on page 121.
2. Damaged data in CMOS memory can cause undetermined problems.
3. Damaged data in BIOS code can cause undetermined problems. See "Recovering BIOS code" on page 24.

Check the LEDs on all the power supplies (see "Power LED errors" on page 130). If the LEDs indicate the power supplies are working correctly, complete the following steps:
1. Turn off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices (one at a time) until you find the failure (turn on the server and reconfigure it each time).
   - Any external devices
   - Surge-suppressor device (on the server)
   - Modem, printer, mouse, or non-IBM devices
   - Each adapter
   - Hard disk drives
   - Memory modules (minimum requirement = 1 GB (2 x 512 MB DIMMs))
   - Service processor

Note: Minimum operating requirements are:
   - 1 microprocessor
   - 2 x 512 MB DIMMs in memory board
   - 1 power supply
   - Power backplane
   - I/O board

4. Turn on the server. If the problem remains, suspect the following FRUs in the following order:
   a. Microprocessor-tray assembly
   b. I/O board
   c. Memory board
   d. Power backplane

Notes:
1. If the problem is solved when you remove an adapter from the server and replacing that adapter does not correct the problem, suspect the I/O board.
2. If you suspect a networking problem and the server passes all the system tests, suspect a network cabling problem external to the server.

Problem-determination tips

Because of the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom
  - Does the server fail the diagnostic programs?
  - What, when, where, single, or multiple servers?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made before it failed?
  - Is this the original reported failure?
- Diagnostics version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS code level
- Operating-system software
  - Type and version level

Note: To eliminate confusion, servers are considered identical only if they:
  - Are the exact machine type and model
  - Have the same BIOS level
  - Have the same adapters and attachments in the same locations
  - Have the same address jumpers, terminators, and cabling
  - Have the same software versions and levels
  - Have the same diagnostics code (version)
  - Have the same configuration options set
  - Have the same setup for the operating-system control files

  Comparing the configuration and software setup between working and non-working servers will often lead to problem resolution.

Chapter 7. Parts listing, Types 8861, 8862

The following parts information is for the xSeries 365, Types 8861, 8862, models 1RX, 2RX, 3RX, 4RX, 5RX, 6RX.
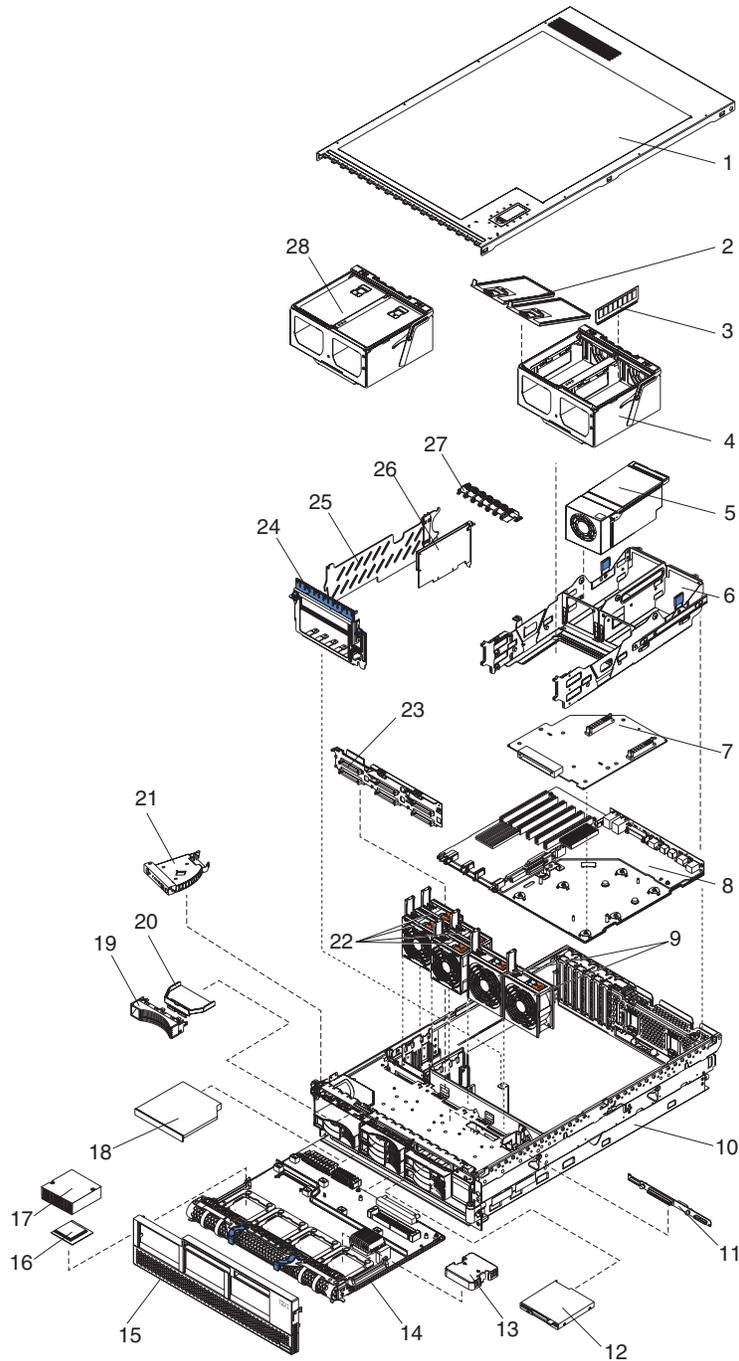
System

Index	xSeries 365, Types 8861, 8862 (models 1RX, 2RX, 3RX, 4RX, 5RX, 6RX)	FRU no.	CRU/FRU
1	Top cover assembly (all models)	90P5044	CRU
2	Memory cassette cover (all models)	90P5049	FRU
3	Memory, 512MB PC2100 ECC (all models)	09N4307	CRU
3	Memory, 1GB PC2100 ECC DDR (optional)	73P2036	CRU
3	Memory, 2GB (optional)	73P2035	CRU
4	Memory cassette (all models)	90P5048	CRU
5	Power supply, 950W (all models)	74P4335	CRU
6	Power supply structure (all models)	90P5045	FRU
7	Power backplane (all models)	73P7211	FRU
8	I/O backplane assembly (all models)	73P7208	FRU
9	Fan, 92mm (all models)	48P9687	CRU
10	Chassis assembly (all models)	90P5043	FRU
11	Media interposer card (all models)	73P7212	FRU
12	Diskette drive, 1.44 MB (all models)	36L8645	CRU
13	Heat sink filler (all models)	90P5047	CRU
14	Microprocessor tray assembly (all models)	73P7207	FRU
15	Front bezel (all models)	90P5050	CRU
16	Microprocessor, 2.0 GHZ (model 1RX)	49P3167	FRU
16	Microprocessor, 2.5 GHZ (model 2RX)	49P3168	FRU
16	Microprocessor, 2.8 GHZ (model 3RX)	49P3169	FRU
17	Heat sink (all models)	90P5046	FRU
18	CD-ROM drive, 24X (all models)	06P5263	FRU
19	Filler, hard disk drive bezel (all models)	06P6245	CRU
20	Air baffle, hard disk drive (all models)	90P5052	CRU
21	Operator information panel (all models)	73P7213	FRU
22	Fan, 80mm (all models)	90P5051	CRU
23	SCSI backplane (all models)	59P5856	FRU
24	Retention module (all models)	90P4309	CRU
25	PCI card guide (all models)	90P5054	CRU
26	Remote Supervisor Adapter II assembly (all models)	73P9265	CRU
27	PCI switch card assembly (all models)	73P6869	FRU
28	Memory board assembly, 8 DIMM slot (models 1RX, 2RX, 4RX, 5RX, 6RX)	73P7209	CRU
28	Memory board assembly, 16 DIMM slot (model 3RX)	73P7210	CRU
	Inlet clip, ac power (model 1RX, 4RX)	90P4301	CRU
	Lift handle kit (all models)	24P1295	CRU
	Battery (all models)	33F8354	CRU
	Cable, Active PCI (all models)	24P1067	FRU
	Cable, external SCSI (all models)	90P5058	CRU
	Cable, flex, diskette drive (all models)	06P4221	FRU
	Cable, hard disk drive power (all models)	90P5056	FRU
	Cable, internal, Remote Supervisor Adapter II (all models)	73P9312	CRU
	Cable, media (all models)	90P5057	FRU
	Cable, operator information panel (all models)	90P5055	FRU
	Cable, breakout, Remote Supervisor Adapter II (all models)	73P9330	CRU
	Cable, SCSI RAID (all models)	02R0715	FRU
	Cable, SCSI tape (optional)	90P5059	FRU
	Cable management arm (all models)	01R0591	CRU
	Left EIA mounting bracket (all models)	90P5060	CRU
	Right EIA mounting bracket (all models)	90P5061	CRU
	Slide assembly (all models)	90P4062	CRU
	VRM 1U/75A (optional)	74P4339	FRU
	System service label (all models)	73P9760	CRU

Index	xSeries 365, Types 8861, 8862 (models 1RX, 2RX, 3RX, 4RX, 5RX, 6RX)	FRU no.	CRU/FRU
	Miscellaneous parts kit (all models):	90P5053	CRU
	• Screw, M3.5x5 (6)		
	• Pivot screw, operator information panel (1)		
	• Grommet, push fastener (2)		
	• Plunger, push fastener (2)		
	• Flex cable, diskette drive (1)		
	• Fastener, twist lock (2)		
	Thermal grease kit (all models)	59P4740	FRU
	Alcohol wipe kit (all models)	59P4739	FRU
	Power cord (all models)	76H4964	CRU
	Line cord (all models)	12J5112	CRU

Keyboard CRUs

Keyboard	FRU No.
US English	37L2551
French Canadian	37L2552
LA Spanish	37L2553
Arabic	37L2555
Belgium/French	37L2556
Belgium/UK	37L2557
Bulgarian	37L2558
Czech	37L2559
Danish	37L2560
Dutch	37L2561
French	37L2562
German	37L2563
Greek	37L2564
Hebrew	37L2565
Hungarian	37L2566
Korean	02K0901
Iceland	37L2567
Italy	37L2568
Norwegian	37L2569
Polish	37L2570
Portuguese	37L2571
Romanian	37L2572
Russian	37L2573
Serbian/Cyrillic	37L2574
Slavic	37L2575
Spanish	37L2576
Swedish/Finn	37L2577
Swiss, F/G	37L2578
Turkish (179)	37L2579
Turkish (440)	37L2580
UK English	37L2581
Yugosl/Lat	37L2582
US English-EMEA	37L2583
Chinese/US	37L2585
Thailand	37L2587
French Canadian	37L0913

Power cord FRUs

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

Power cord rating	IBM power cord part number (2.5 m)	Used in these countries and regions
15 A/125 V ac	12J5112	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Columbia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States, Venezuela
15 A/250 V ac	76H4964	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Columbia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States, Venezuela

Power cord rating	IBM power cord part number (2.5 m)	Used in these countries and regions
16 A/250 V ac	55H6643	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Korea (Democratic Peoples Republic of), Korea (Republic of), Kyrgyzstan, Laos (Peoples Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
16 A/250 V ac	36L8822	Denmark, Liechtenstein, Switzerland
16 A/250 V ac	12J5122	Israel
16 A/250 V ac	12J5126	Chile, Italy, Libyan Arab Jamahiriya
16 A/250 V ac	12J5124	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
13 A/250 V ac	12J5987	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, Cyprus, Dominica, Gambia, Ghana, Grenada, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Qatar, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad & Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
15 A/250 V ac	12J5128	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
15 A/250 V ac	01K9851	China
15 A/250 V ac	49P2114	Brazil
15 A/250 V ac	49P2082	India
15 A/250 V ac	36L8884	Argentina, Paraguay, Uruguay
15 A/125 V ac	01K9853	Japan

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD or in the *Hardware Maintenance Manual* on the IBM *IntelliStation Documentation* CD.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation® systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/intellistation/.

You can find service information for your IBM products, including supported options, at http://www.ibm.com/pc/support/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to http://www.ibm.com/services/sl/ products/.

For more information about Support Line and other IBM services, go to http://www.ibm.com/services/, or go to http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to http://www.ibm.com/planetwide/ for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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

Appendix B. Related service information

Note: The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that are familiar with the computers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM computer.

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 server 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

  and 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. Turn 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 server, 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 in the following list, 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.

Safety notices (multilingual translations)

The caution and danger safety notices in this section are provided in the following languages:
*   English
*   Brazilian/Portuguese
*   Chinese
*   French
*   German
*   Italian
*   Japanese
*   Korean
*   Spanish

Important: All caution and danger statements in this IBM documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements 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 procedure**s.
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
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.	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.**

Statement 4
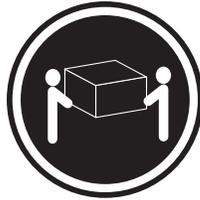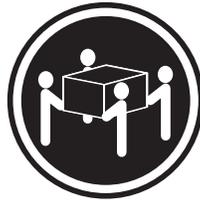
≥18 kg (39.7 lb)   ≥32 kg (70.5 lb)   ≥55 kg (121.2 lb)

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.

2

1
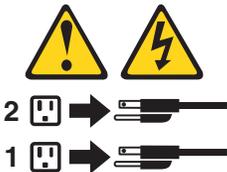
Statement 8

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.

Statement 10

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

Statement 13

DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your IBM device for electrical specifiacations.

Statement 14

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the following label is attached.

Importante:

Todas as instruções de cuidado e perigo da IBM documentation 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:
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.	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 móídulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de mídulo, 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 ítica, 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 íticos, e evite exposição direta ao raio.

Instrução 4
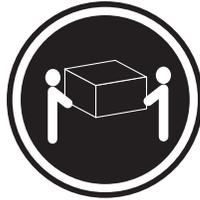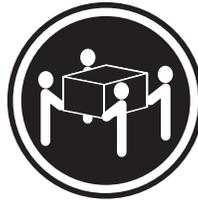
≥18 kg (39.7 lb)　　≥32 kg (70.5 lb)　　≥55 kg (121.2 lb)

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.
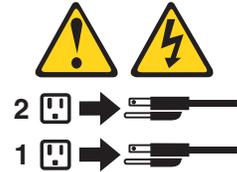
Instrução 8

CUIDADO:

Nunca remova a tampa de uma fonte de alimentação ou de qualquer peça que tenha esta etiqueta afixada.

Níveis perigosos de voltagem, corrente e energia estão presentes em qualquer componente que tenha esta etiqueta afixada. Nenhuma peça localizada no interior desses componentes pode ser consertada. Se você suspeitar de algum problema em alguma dessas peças, entre em contato com um técnico IBM.

Instrução 10

CUIDADO:

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

Instrução 13

PRECAUCIÓN:

A sobrecarga em um circuito derivado apresenta um risco potencial de incêndio e de choque sob determinadas condi ções. Para evitar estes riscos, assegure que os requisitos elétricos de seu sistema não excedam os requisitos de prote ção do circuito derivado. Para conhecer as especifica ções elétricas, consulte as informa ções fornecidas com seu dispositivo IBM.

Instrução 14

CUIDADO:

Níveis perigosos de voltagem, corrente e energia podem estar presentes. Apenas um técnico qualificado de manuten ção está autorizado a remover as tampas em que esta etiqueta esteja afixada.

重要：

　　　　　Server Library 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。

将应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：	断开连接时：
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔下信号电缆。
4. 将电源线连接至插座。	

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：
扔入或浸入水电　　　。
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 13

危险

分支电路过载在某些情况下可能导致火灾和电击。
为避免这些危险，请确保您系统的电力需求不超出分支电路
保护需求。请参阅随 **IBM** 设备提供的信息以了解电气规范。

声明 **14**

⚠

注意：
可能存在危险的电压、电流和能级。
只有合格的维修技术人员才可打开贴有以下标签的舱盖。

⊗ ⚡

重要資訊：

Server Library 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。
−僅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，請勿開啟該設備的電源。
−在安裝及架構之時，若非非常熟悉，在開啟裝置蓋子之前，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，或開啟其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：	切斷：
1.關閉所有開關。	1.關閉所有開關。
2.先將所有電纜線接上裝置。	2.先自電源插座拔掉電源線。
3.將信號電纜接上接頭。	3.拔掉接頭上的所有信號電纜。
4.再將電源線接上電源插座。	4.再拔掉裝置上的所有電纜線。
5.開啟裝置的電源。	

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 ℃ (212 ℉)
− 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：

開啟時會產生雷射輻射。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 8

注意：
嚴禁移除電源供應器的蓋子，或任何貼有下列標籤的組件。

貼有此標籤的元件內均有危險的電壓、電流及能源。這些元件中沒有需要
維修的組件。若察覺問題發生在上述組件時，請與服務人員聯絡。

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)

聲明 13

危險

分支電路超載可能會引發火災，在特定情況下會有電擊之
虞。為避免這些危險發生，請確定您的系統電力需求不超
過分支電路的保護需求。請參閱 IBM 電力規格裝置所附的
資訊。

聲明 14

注意：
可能會有危險的電壓、電流或能源量。僅授權合格的維修
技師在貼上以下標籤之處移除外殼。

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque IBM documentation 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.

Notice n° 1

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 relient 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
1. Mettez les unités hors tension.	1. Mettez les unités hors tension.
2. Commencez par brancher tous les cordons sur les unités.	2. Débranchez les cordons d'alimentation des prises.
3. Branchez les câbles d'interface sur des connecteurs.	3. Débranchez les câbles d'interface des connecteurs.
4. Branchez les cordons d'alimentation sur des prises.	4. Débranchez tous les câbles des unités.
5. Mettez les unités sous tension.	

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
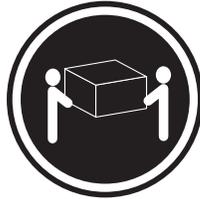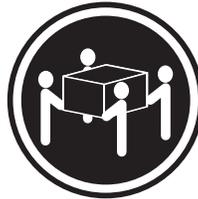
≥18 kg (39.7 lb)   ≥32 kg (70.5 lb)   ≥55 kg (121.2 lb)

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° 8

ATTENTION:

N'ouvrez jamais le bloc d'alimentation ou tout élément sur lequel e apposée l'étiquette ci-dessous.

Des tensions et des courants dangereux sont présents à l'intérie de tout composant sur lequel est apposée cette étiquette. Ces éléments ne peuvent pas être réparés. Si vous pensez qu'ils peuvent être à l'origine d'un incident, prene contact avec un technicien de maintenance.

Notice n° 10

ATTENTION:

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

Notice n° 13

DANGER

La surcharge d'un circuit de dérivation peut entraîner un risque d'incendie ou de choc électrique sous certaines conditions. Pour éviter ces risques, assurez-vous que les besoins électriques de votre système ne sont pas supérieurs aux capacités de votre circuit de dérivation. Pour les spécifications électriques, reportez-vous aux informations fournies avec votre unité IBM.

Notice n° 14

ATTENTION:

Des tensions et des courants dangereux peuvent ê tre présents. Seul un technicien de maintenance qualifié est autorisé à retirer les carters signalés par l'étiquette ci-dessous.

Wichtig:

Alle Sicherheitshinweise in dieser IBM documentation 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 anschlie*β*en:	Kabel lösen:
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.	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
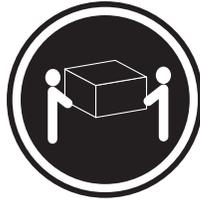
≥18 kg   ≥32 kg   ≥55 kg

ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5

ACHTUNG:

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

Hinweis 8

ACHTUNG:

Die Abdeckung oder eine Komponente eines Netzteils, die wie nachfolgend aufgeführt gekennzeichnet ist, darf keinesfalls entfernt werden.

In Komponenten, die so gekennzeichnet sind, können gefährliche Spannungen anliegen. In diesen Komponenten sind keine Teile vorhanden, die vom Benutzer gewartet werden müssen. Besteht der Verdacht, dass an einem dieser Teile ein Fehler aufgetreten ist, ist ein IBM Kundendiensttechniker zu verständigen.

Hinweis 10

ACHTUNG:

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

Hinweis 13

VORSICHT

Durch überlastung des Netzstromkreises besteht unter bestimmten Bedingungen die Gefahr eines Brandes und eines elektrischen Schlages. Um solche Gefahrenquellen zu vermeiden, sollten Sie daher sicherstellen, dass die Spannungswerte Ihres Systems nicht über den aus Sicherheitsgründen festgelegten Werten des Netzstromkreises liegen. Weitere Informationen hierzu finden Sie in der Dokumentation, die Sie zusammen mit der IBM Einheit erhalten haben.

Hinweis 14

ACHTUNG:

Es können gefährliche Spannungen und Ströme auftreten. Die Abdeckungen, die durch folgendes Etikett gekennzeichnet sind, dürfen nur von einem qualifizierten Mitarbeiter des technischen Kundendienstes entfernt werden.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione IBM documentation 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:
1. SPEGNERE tutti i dispositivi.	1. SPEGNERE tutti i dispositivi.
2. Collegare prima tutti i cavi alle unità.	2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.
3. Collegare i cavi di segnale ai connettori.	3. Rimuovere i cavi di segnale dai connettori.
4. Collegare i cavi di alimentazione alle prese elettriche.	4. Rimuovere tutti i cavi dalle unità.
5. ACCENDERE le 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:

Aprendo 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
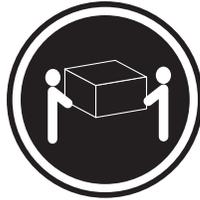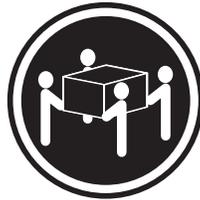
≥18 kg   ≥32 kg   ≥55 kg

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.
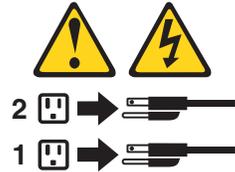
Avviso 8

ATTENZIONE:

Non togliere mai il coperchio di un alimentatore o qualsiasi parte su cui è posta la seguente etichetta.

Tensioni pericolose, corrente e livelli di energia sono presenti all'interno del componente su cui è posta questa etichetta. All'interno di questi componenti non vi sono parti su cui effettuare l'assistenza tecnica. Se si sospetta un problema in una di queste parti, rivolgersi ad un tecnico di manutenzione.

Avviso 10

ATTENZIONE:

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

Avviso 13

PERICOLO

Il sovraccarico di un impianto elettrico può generare un pericolo di incendio o di scosse elettriche in determinate situazioni. Per evitare questi pericoli, verificare che i requisiti elettrici del sistema non superino i requisiti di protezione dell'impianto elettrico. Per le specifiche elettriche, consultare le informazioni fornite con il dispositivo IBM.

Avviso 14

ATTENZIONE:

E' possibile che siano presenti livelli pericolosi di tensione, corrente ed energia. Solo i tecnici qualificati sono autorizzati a rimuovere i coperchi sui quali è posta la seguente etichetta.

重要：

Netfinity Server　ライブラリーにあるすべての注意および危険の記述は
数字で始まります。この数字は、英語版の注意および危険の記述と翻訳さ
れた注意および危険の記述を相互参照するために使用します。

例えば、もし注意の記述が数字の１で始まってる場合は、その注意の翻訳は、
記述１　の下にあります。

手順を実施する前に、すべての注意

・記述　1

⚠ 危険

感電を防止するため、雷の発生時には、いかなるケーブルの
取り付けまたは取り外しも行わないでください。また導入、
保守、再構成などの作業も行わないでください。

感電を防止するため：

　- 電源コードは正しく接地および配線が行われている
　　電源に接続してください。

　- 本製品が接続されるすべての装置もまた正しく配線
　　された電源に接続されている必要があります。

できれば、信号ケーブルに取り付けまたは取り外しのとき
は片方の手のみで行うようにしてください。これにより、
電位差がある二つの表面に触ることによる感電を防ぐことが
できます。

電源コード、電話ケーブル、通信ケーブルからの電流は身体に
危険を及ぼします。設置、移動、または製品のカバーを開けたり
装置を接続したりするときには、以下のようにケーブルの接続、
取り外しを行ってください。

接続するには	取り外すには
1. すべての電源を切る	1. すべての電源を切る
2. まず、装置にすべての　ケーブルを接続する。	2. まず、電源コンセントから　電源コードを取り外す
3. 次に、通信ケーブルを　コネクターに接続する	3. 次に、通信ケーブルを　コネクターから取り外す。
4. その後、電源コンセントに　電源コードを接続する	4. その後、装置からすべての　ケーブルを取り外す
5. 装置の電源を入れる。	

・記述 2

⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用さ
れています。電池の交換方法や取り扱いを誤ると、発熱、
発火、破裂のおそれがあります。
電池の交換には、IBM部品番号33F8354の電池またはメーカー
推奨の同等の電池を使用してください。
交換用電池の購入については、お買い求めの販売店または
弊社の営業担当までお問い合わせください。
電池は幼児の手の届かない所に置いてください。
万一、幼児が電池を飲み込んだときは、直ちに医師に相談
してください。
以下の行為は絶対にしないでください。
－水にぬらすこと
－100度C 以上の過熱や焼却
－分解や充電
－ショート
電池を廃棄する場合、および保存する場合にはテープなど
で絶縁してください。他の金属や電池と混ざると発火、
破裂の原因となります。電池は地方自治体の条例、または
規則に従って廃棄してください。ごみ廃棄場で処分される
ごみの中に捨てないでください。

・記述 3

⚠ 注意

レーザー製品(CD-ROM、DVD、または光ファイバー装置または
送信器など)が組み込まれている場合は、下記に御注意ください。

－ここに記載されている制御方法、調整方法、または性能を超えて使用
　すると、危険な放射線を浴びる可能性があります。

－ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。
　ドライブの内部に修理のために交換可能な部品はありません。カバーを
　開けないでください。

⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザー・
ダイオードを使用しています。 次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。
光線をみつめたり、光学器械を使って直接見たりしないで
ください。また直接光線を浴びないようにしてください。

・記述 4

⚠ 注意

18Kg 以上　　　　32Kg 以上　　　　55Kg 以上

装置を持ち上げる場合は、安全に持ち上げる方法に従ってください。

・記述 5

⚠ 注意 ⚡

サーバーの前面にある電源制御ボタンは、サーバーに供給された
電流を遮断しません。
サーバーには、複数の電源コードが接続されているかもしれません。
サーバーから電流を完全に遮断するために、すべての電源コードが
電源から取り外されていることを確認してください。
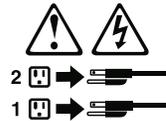
・記述 8

⚠ 注意

この機器のなかにある電源のカバーは取り外さないでください。
また、下記のラベルが貼られているいかなる部品（電源のバック・
プレーンおよびＡＣボックス）も取り外さないでください。

電源、電源のバックプレーンおよび AC ボックスの内部には
危険な電圧、電流およびエネルギーがあり危険です。
電源、電源のバックプレーンおよび AC ボックスの内部には
保守部品はありません。
これらの部品に問題があるときは販売店または保守サービス会社
にご連絡ください。

・記述 10

⚠ 注意

ラック・モデルのサーバーの上に 82 Kg 以上の物を置かないで
ください。

・記述 13

⚠ ⚡

危険

電源回路に過電流が流れると、ある条件のもとでは火災や
感電を起す危険があります。このような危険を避けるため
には、ご使用のシステムの消費電力が電源回路の保護要件
を超えない範囲におさえる必要があります。IBM 機器の消
費電力については付属の資料の「仕様」のページをご覧く
ださい。

・記述 14

⚠

注意

危険な電圧、電流、エネルギーが存在します。次のラベルが貼
られているカバーを開けるのは、教育を受けたサービス技術者
だけに許されています。

⊗ ⚡

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로
시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는
번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의
경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을
읽으십시오.

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.

- 가능한한 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:	연결을 끊으려면:
1. 모든 스위치를 끕니다.	1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.	2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에 연결합니다.	3. 신호 케이블을 커넥터에서 제거합니다.
4. 콘센트에 전원 코드를 연결합니다.	4. 장치에서 모든 케이블을 제거합니다.
5. 장치 스위치를 켭니다.	

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.

다음을 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100℃(212℉) 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 클래서 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 있는 지 확인하십시오.

경고문 8

주의:
다음 레이블이 붙어 있는 전원 공급기나 부품의 덮개를 제거하지
마십시오.

이 레이블이 부착되어 있는 컴포넌트 안에는 위험한 전압, 전류 및
에너지 레벨이 있습니다. 이 컴포넌트 안에는 서비스 받을 수
있는 부품이 없습니다. 이들 부품에 문제가 있을 경우 서비스
기술자에게 문의하십시오.

경고문 10

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

> 82 kg (180 lbs)

경고문 **13**

위험

분기 회로가 과부화되면 특정 상황에서 화재와 전기 충격이
발생할 수 있습니다. 이러한 충격을 방지하려면 귀하의
시스템 전기 요구량이 분기 회로 보호 요구량을 초과하지
않도록 하십시오. 전기 사양에 대해서는 **IBM** 디바이스와
함께 제공되는 정보를 참조하십시오.

경고문 **14**

주의**:**
위험한 전압, 전류 및 에너지 레벨이 있을 수 있습니다. 다음
레이블이 붙어있는 커버는 공인된 서비스 기술자만이 제거
할 수 있습니다.

Importante:

Todas las declaraciones de precauciín de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaraciín de precauciín o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta secciín.

Por ejemplo, si una declaraciín de peligro empieza con el número 1, las traducciones de esta declaraciín de precauciín aparecen en esta secciín bajo Declaraciín 1.

Lea atentamente todas las declaraciones de precauciín y peligro antes de llevar a cabo cualquier operaciín.

Declaración 1

PELIGRO

La corriente eléctrica de los cables telefínicos, de alimentaciín y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:
- No conecte ni desconecte ningún cable ni realice las operaciones de instalaciín, mantenimiento o reconfiguraciín de este producto durante una tormenta.
- Conecte cada cable de alimentaciín a una toma de alimentaciín eléctrica con conexiín a tierra y cableado correctos.
- Conecte a tomas de alimentaciín 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 sent.al.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundaciín o de daños estructurales.
- Desconecte los cables de alimentaciín, sistemas de telecomunicaciones, redes y mídems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalaciín y configuraciín.
- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operaciín de instalaciín, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexin	Para la desconexiín
1. APÁGUELO todo.	1. APÁGUELO todo.
2. En primer lugar, conecte los cables a los dispositivos.	2. En primer lugar, retire cada cable de alimentaciín de la toma de alimentaciín.
3. Conecte los cables de señal a los conectores.	3. Retire los cables de señal de los conectores.
4. Conecte cada cable de alimentaciín a la toma de alimentaciín.	4. Retire los cables de los dispositivos.
5. ENCIENDA el dispositivo.	

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 mídulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de mídulo, 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 legislaciín local.

Declaración 3

PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra íptica o transmisores), tenga en cuenta las advertencias siguientes:
*   No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiaciín láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
*   El uso de controles o ajustes o la realizaciín de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposiciín 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 radiaciín láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ípticos; evite la exposiciín directa al rayo.

Declaración 4
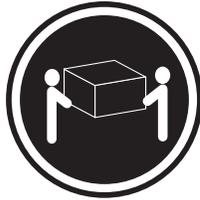
≥18 kg   ≥32 kg   ≥55 kg

PRECAUCIÓN:

Tome medidas de seguridad al levantar el producto.

Declaración 5

PRECAUCIÓN:

El botín de control de alimentaciín del dispositivo y el interruptor de alimentaciín de la fuente de alimentaciín no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentaciín. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentaciín de la fuente de alimentaciín.

Declaración 8

PRECAUCIÓN:

No retire nunca la cubierta de una fuente de alimentación ni ninguna pieza que tenga adherida la etiqueta siguiente.

Existen niveles perjudiciales de energía, corriente y voltaje en los componentes que tienen adherida esta etiqueta. Dentro de estos componentes no existe ninguna pieza que requiera mantenimiento. Si sospecha que alguna de estas piezas tiene un problema, póngase en contacto con un técnico de servicio.

Declaración 10

PRECAUCIÓN:

No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

Declaración 13

PELIGRO

La sobrecarga de una conexión puede resultar potencialmente en peligro de fuego y peligro de descarga bajo ciertas condiciones. Para evitar estos peligros, compruebe que los requisitos eléctricos de su sistema no excedan los requisitos de seguridad de la conexión. Consulte la información que viene con el dispositivo de IBM para obtener las especificaciones eléctricas.

Declaración 14

PRECAUCIÓN:

Es posible que haya niveles peligrosos de energía, voltaje o corriente. Sólo está autorizado a extraer las cubiertas que llevan la siguiente etiqueta un técnico de servicio cualificado.

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EtherJet	Tivoli Enterprise
FlashCopy	Update Connector
IBM	Wake on LAN
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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml or contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. 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. 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 Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du 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 EMC Directive conformance statement

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

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/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.

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.

Taiwanese Class A warning 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。

Chinese Class A warning statement

声   明
此为 A 级产品。在生活环境中,
该产品可能会造成无线电干扰。
在这种情况下,可能需要用户对其
干扰采取切实可行的措施。

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。

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